G.SHDSL.bis
Bridge Modem

5210D

User Manual

Version 0.01

Table of Contents

1 DESCRIPTIONS 3

1.1 FEATURES 3
1.2 SPECIFICATION 3
1.3 APPLICATIONS 5

2 GETTING TO KNOW ABOUT THE MODEM 6

2.1 FRONT PANEL 6
2.1 REAR PANEL 6
2.2 SHDSL.BIS LINE CONNECTOR 7
2.3 CONSOLE CABLE 7

3 INSTALL TO THE MODEM 8

3.1 CHECK LIST 8
3.2 INSTALL THE SHDSL.BIS MODEM 9

4 CONFIGURATION VIA WEB BROWSER 10

4.1 BASIC SETUP 13
4.1.1 Bridge Mode 13
4.1.2 Reference Diagram 16
4.2 ADVANCED SETUP 17
4.2.1 SHDSL.bis 17
4.2.1.1 Annex Type 17
4.2.1.2 Data Rate (N*64kbps) 18
4.2.1.3 SNR Margin 18
4.2.1.4 TC Layer 18
4.2.1.5 Rate Mode 18
4.2.2 WAN 19
4.2.2.1 Protocol, IP address and subnet 19
4.2.2.2 VPI 20
4.2.2.3 VCI 20
4.2.2.4 AAL5 Encap 20
4.2.2.5 QoS class 20
4.2.2.6 QoS PCR 20
4.2.2.7 QoS SCR 21
4.2.2.8 QoS MBS 21
4.2.3 Bridge 21
4.2.4 VLAN 24
4.2.4.1 802.1Q Tag-Based VLAN 24
4.2.4.2 Port-Based VLAN 25
4.2.5 STP 27
4.3 STATUS 28
4.3.1 SHDSL.bis 29
4.3.2 LAN 30
4.3.3 WAN 31
4.3.4 INTERFACE 32
4.3.5 STP 33
4.4 ADMINISTRATION 35
4.4.1 Security 35

4.4.2 SNMP *38*
4.4.2.1 Community pool 38
4.4.2.2 Trap host pool 39
4.4.3 SYSLOG *40*
4.4.4 Time Sync *41*
4.4.4.1 Synchronization with PC 41
4.4.4.2 SNTP v4.0 42
4.5 UTILITY 43
4.5.1 System Info *43*
4.5.2 SYSLOG *44*
4.5.3 Config Tool *45*
4.5.3.1 Load Factory Default 46
4.5.3.2 Restore Configuration 46
4.5.3.3 Backup Configuration 46
4.5.4 Upgrade *47*
4.5.5 Logout *48*
4.5.6 Restart *49*
4.6 EXAMPLE 50
4.6.1 LAN-to-LAN connection with bridge Mode *50*
4.6.1.1 CO side 50
4.6.1.2 CPE Side 51
5 CONFIGURATION VIA SERIAL CONSOLE OR TELNET WITH MENU DRIVEN INTERFACE 52
5.1 INTRODUCTION 52
5.1.1 Serial Console *52*
5.1.2 Telnet *52*
5.1.3 Operation Interface *53*
5.1.4 Window structure *54*
5.1.5 Menu Driven Interface Commands *54*
5.2 MAIN MENU 56
5.3 STATUS 56
5.3.1 Shdsl.bis *57*
5.3.2 Wan *57*
5.3.3 Interface *58*
5.3.4 STP *58*
5.4 SHOW 59
5.4.1 System information *59*
5.4.2 Configuration information *59*
5.4.3 Configuration with Script format *60*
5.5 PING 60
5.6 EXIT 60

1 Descriptions

The Proscend 5210D is G.SHDSL.bis bridge modem with four Ethernet interfaces to a computer. It provides a very stable system installation with a simplified set of configuration options to ensure problem free operation.

It complies with G.991.2 (2004) standard optimized for small to medium size business environment. It provides business-class, multi-range from 192Kbps to 5.696Mbps symmetric payload rates over existing copper wire.

It support four 10Base-T/100Base-T auto-negotiation and auto-MDI/MDIX switching ports to meet the enterprise need.

1.1 Features

- An easy-to-use graphic interface s accessed using any Web browser software for configuration and management with password control for various application environments
- A menu-driven interface/Command-line interface (CLI) for local console and Telnet access for configuration and management
- Four 10/100Mbps Auto-negotiation and Auto-MDI/MDIX switching ports for flexible local area network connectivity
- Fully ATM/EFM protocol stack implementation over SHDSL.bis
- Getting enhancements and new features via Internet software upgrade

1.2 Specification

Bridge MODE

- Ethernet to SHDSL.bis self learning - Transparent Bridging (IEEE 802.1D)
- Supports up to 2048 MAC learning addresses

Management

- Easy-to-use web-based GUI for quick setup, configuration and management
- Menu-driven interface/Command-line interface (CLI) for local console and Telnet access
- Password protected management and access control list for administration
- Software upgrade via web-browser

ATM with Traffic shaping

- UBR (Unspecified bit rate)
- CBR (Constant bit rate)
- VBR-rt (Variable bit rate real-time)
- VBR-nrt (Variable bit rate non-real-time)

AAL5 Encapsulation

- VC multiplexing and SNAP/LLC

- Ethernet over ATM (RFC 2684/1483)

WAN Interface

- SHDSL.bis: ITU-T G.991.2 (2004) Compliance
- Annex A, B and AB supported
- Encoding scheme: 16-TCPAM/32-TCPAM
- Data Rate: N x 64Kbps (N=3 to 89)
- Impedance: 135 ohms

LAN Interface

- 4-ports switching hub
- 10/100Mbps, half/full duplex auto-sensing and auto-negotiation
- Auto-MDI/MDIX (Automatic cross-over)

Hardware Interface

- WAN: RJ-45 connector
- LAN: RJ-45 connector
- Console: DB-9(Female) connector
- Reset Button: Reset button for factory default
- DC-IN: 12V DC power input connector

Indicators

- General: PWR
- WAN: LNK, ACT
- LAN: 1,2,3,4 LNK/ ACT
- SHDSL.bis: ALM

Physical/Electrical

- Dimensions: 18.7 x 3.3 x 14.5cm (WxHxD)
- Power: 100~240VAC (via power adapter)
- Power consumption: 9 watts maximum.
- Temperature: 0~45°C
- Humidity: 0%~95%RH (non-condensing)

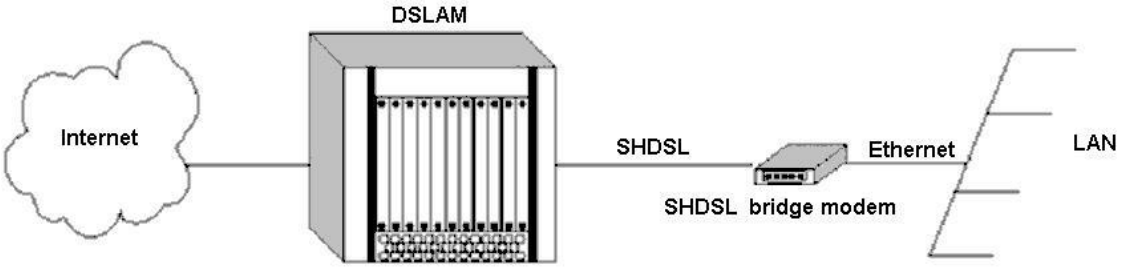
Memory

- 2MB Flash Memory, 16MB SDRAM

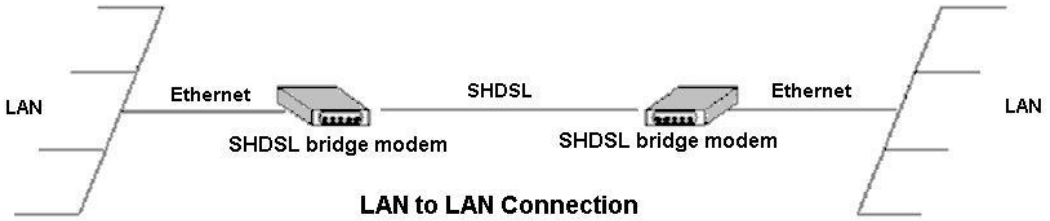
Products' Information

✧ 5210D G.SHDSL.bis Bridge Modem with 4-ports LAN

1.3 Applications



Connection with DSLAM



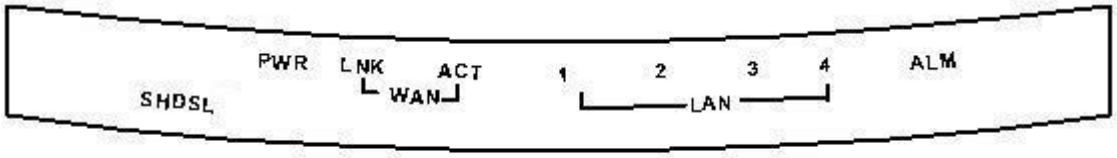
LAN to LAN Connection

2 Getting to know about the modem

This section will introduce hardware of the modem.

2.1 Front Panel

The front panel contains LEDs which show status of the modem.

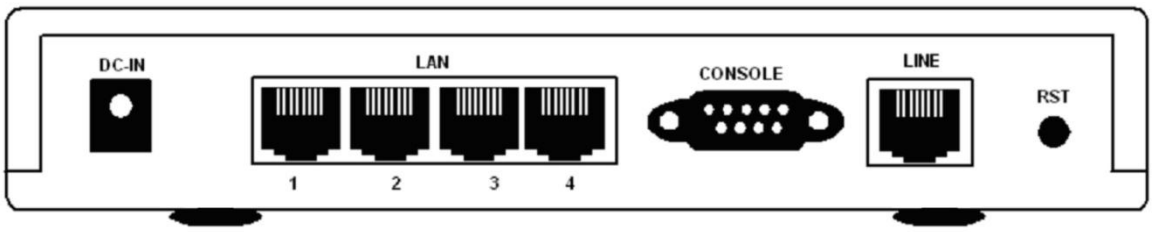


LED status description on front panel:

LEDs		Active	Description
PWR		On	Power adaptor is connected to the modem
WAN	LNK	On	SHDSL.bis line connection is established
		Blink	SHDSL.bis handshake
	ACT	Blink	Transmit or received data over SHDSL.bis link
LAN	(1,2,3,4)	On	Ethernet cable is connected to LAN
		Blink	Transmit or received data over LAN
ALM		On	SHDSL.bis line connection is dropped
		Blink	SHDSL.bis self test

2.1 Rear Panel

The rear panel of SHDSL.bis bridge modem is where all of the connections are made.



Connectors description on rear panel:

Connector	Description
DC-IN	To connect your power outlet use the power adaptor inlet that comes with your package.
LAN (1,2,3 and 4)	Ethernet 10/100BaseT auto-sensing and auto-MDIX for LAN port (RJ-45) to connect the unit to an access point, a network hub, or the Ethernet port of a computer.
CONSOLE	RS- 232 Console port for system configuration and maintenance (DB-9F)
LINE	SHDSL.bis interface for WAN port (RJ-45)
RES	Reset button to reboot or reset your modem to factory default setting (All customized settings that you have saved will be lost).

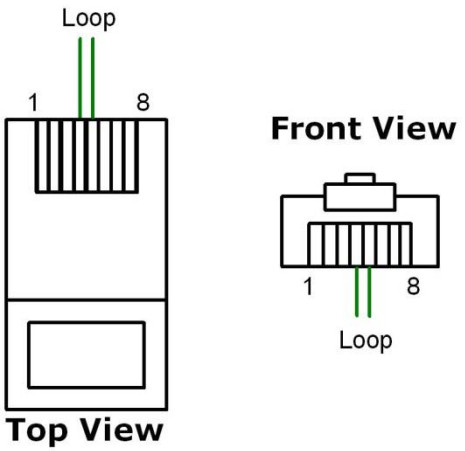
The reset button can be used only in one of two ways.

(1) Press the Reset Button for one second will cause system reboot.

(2) Pressing the Reset Button for four seconds will cause the product loading the factory default setting and losing all of yours configuration. When you want to change its configuration but forget the user name or password, or if the product is having problems connecting to the Internet and you want to configure it again clearing all configurations, press the Reset Button for four seconds with a paper clip or sharp pencil.

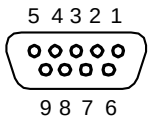
2.2 SHDSL.bis Line Connector

Below figure show the SHDSL.bis line cord plugs pin asignment:



2.3 Console Cable

Below figure show the cosole cable pins asignment:

Pin Number	Description		Figure
1			 Front view of DB-9(F) of the Console Cable
2	RXD	Receive Data	
3	TXD	Transmit date	
4			
5	G	Signal Groung	
6			
7			
8			

3 Install to the Modem

This guide is designed to let users through Web Configuration or serial console with G.SHDSL .bis modem in the easiest and quickest way possible. Please follow the instructions carefully.

Note: There are three methods to configure the modem: serial console, Telnet and Web Browser. Only one configuration application is used to setup the modem at any given time. Users have to choose one method to configure it.
For Web configuration, you can skip item 3.
For Serial Console Configuration, you can skip item 1 and 2.
For Telnet configuration, you can skip 3.

3.1 Check List

(1) Check the Ethernet Adapter in PC or NB

Make sure that Ethernet Adapter had been installed in PC or NB used for configuration of the modem. TCP/IP protocol is necessary for web configuration, so please check the TCP/IP protocol whether it has been installed.

(2) Check the Web Browser in PC or NB

According to the Web Configuration, the PC or NB need to install Web Browser, IE or Netscape.
Note: Suggest to use IE5.0, Netscape 6.0 or above and 800x600 resolutions or above.

(3) Check the Terminal Access Program

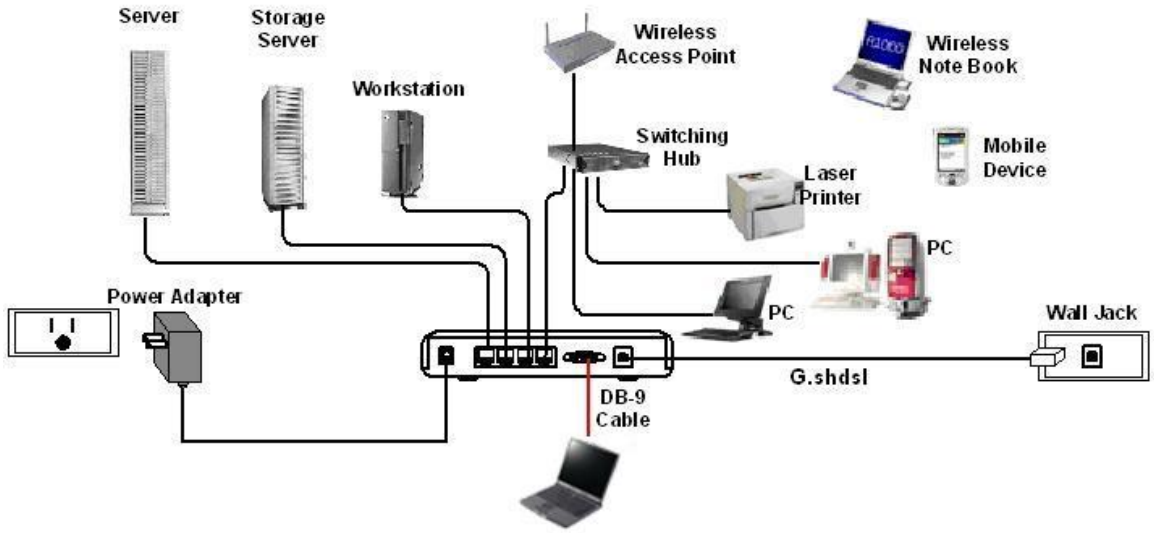
For Serial Console and Telnet Configuration, users need to setup the terminal access program with VT100 terminal emulation.

3.2 Install the SHDSL.bis Modem

To avoid possible damage to this modem, do not turn on the modem before Hardware Installation.

- Connect the power adapter to the port labeled DC-IN on the rear panel of the product.
- Connect the Ethernet cable.

  The device supports auto-MDIX switching so both straight through and cross-over Ethernet cable can be used.
- Connect the phone cable to the modem and the other side of phone cable to wall jack.
- Connect male end of RS-232 cable to the product and female end to any free COM port of PC.
- Connect the power adapter by plugging power supply.



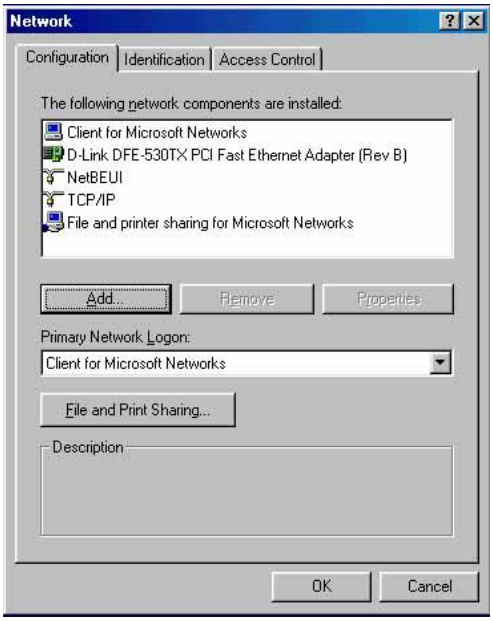
Wire connection for SHDSL.bis modem

4 Configuration via Web Browser

Step.1 Click the **start** button. Select **setting** and **control panel**.

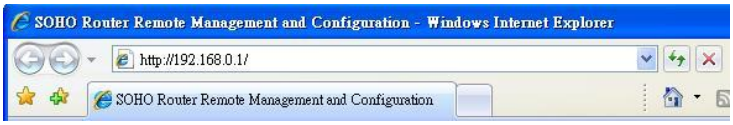
Step.2 Double click the **network** icon.

In the Configuration window, select the **TCP/IP** protocol line that has been associated with your network card and then click **property** icon.



Choose IP address tab.
Select **Specify an IP address**.
Type IP Address and Subnet Mask items.
Click **OK** button.

Open IE or Netscape Browser to connect the modem. Type
http://192.168.0.1


SOHO Router Remote Management and Configuration - Windows Internet Explorer
http://192.168.0.1/
SOHO Router Remote Management and Configuration

The default IP address and sub net-mask of the modem is 192.168.0.1 and 255.255.255.0.

Type User Name root and Password root and then click OK.

The default user name and password both is *root*. For the system security, suggest changing them after configuration.

Note: After changing the User Name and Password, strongly recommend you to save them because another time when you login, the User Name and Password have to be used the new one you changed.

Function overview

Following is the function overview of G.SHDSL.bis modem.

INDEX

Function Overview

Following list is the SOHO Bridge function overview. If you want to see more information, click the link of specific feature on the left window.

- **BASIC (Quick Setup)**
- **ADVANCED**
  - SHDSL.bis
  - LAN
  - WAN
  - BRIDGE
  - VLAN
  - STP
- **STATUS**
  - SHDSL.bis
  - LAN
  - WAN
  - INTERFACE
  - STP
- **ADMIN**
  - SECURITY
  - SNMP
  - SYSLOG
  - TIME SYNC
- **UTILITY**
  - SYSTEM INFO
  - SYSLOG
  - CONFIG TOOL
  - FIRMWARE UPGRADE
  - LOGOUT
  - RESTART

4.1 Basic Setup

The Basic Setup contains operation mode, basic LAN and WAN interface set up. User can use it to completely setup the modem. After successfully completing it, you can access Internet or as LAN extension. This is the easiest and possible way to setup the modem.

Note: The advanced functions are only for advanced users to setup advanced functions. The incorrect setting of advanced function will affect the performance or system error, even disconnection.

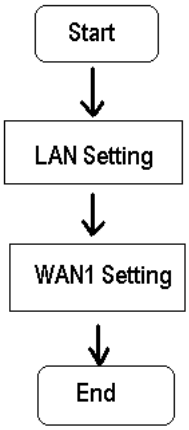
Click Basic for basic installation.

4.1.1 Bridge Mode

Parameter Table:

SHDSL.bis	☐CO side ☐CPE side	
LAN	IP address	
	Subnet Mast	
	Gateway	
	Host Name	
WAN1	VPI	
	VCI	
	Encapsulation	☐VC-mux ☐LLC

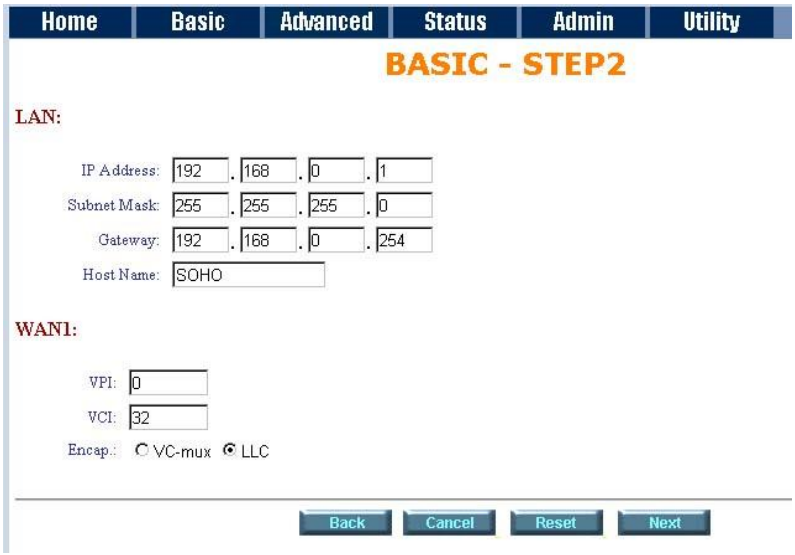
The flow chart of bridge mode setup:



Setup up system mode and SHDSL.bis mode

This modem can be setup as one of two SHDSL.bis working mode: **CO side**(Central Office) and **CPE side** (Customer Premises Equipment). For connection with DSLAM, the SHDSL.bis modem working mode is CPE. For “LAN to LAN” connection, one side must be CO and the other side must be CPE.

Set up (a) LAN IP address , Subnet Mask, Gateway and Host Name
(b) WAN1 VPI,VCI and Encapsulation



For example,

(a) LAN IP address , Subnet Mask, Gateway and Host Name

LAN:

IP: 192.168.0.1

Subnet Mask: 255.255.255.0

Gateway: 192.168.0.254

Host Name: SOHO

Some of the ISP requires the Host Name as identification. You may check with ISP to see if your Internet service has been configured with a host name. In most cases, this field can be ignored.

(b) WAN1 VPI,VCI and Encapsulation

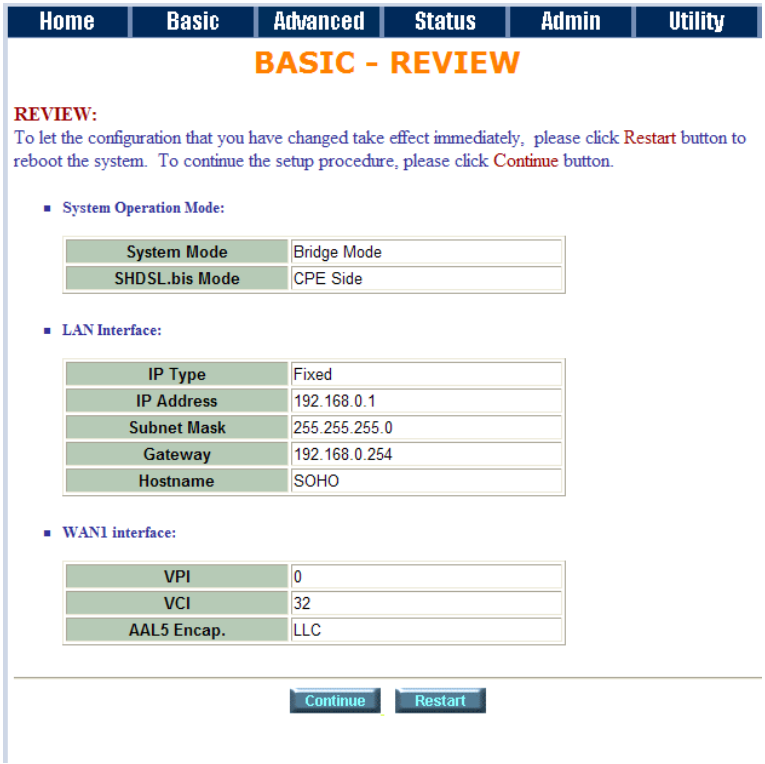
WAN1:

VPI: 0

VCI: 32

Encap: Click LLC

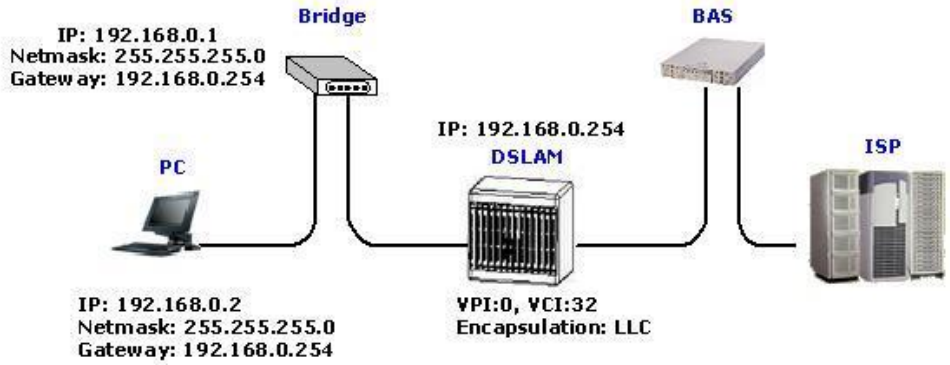
Click Next to review the setting data:



The screen will prompt the new configured parameters. Checking the parameters and Click Restart The modem will reboot with the new setting or Continue to configure another parameters.

4.1.2 Reference Diagram

For bridge modem, it will act as a pass-through device and allow the workstations on your LAN to have public addresses directly on the internet.

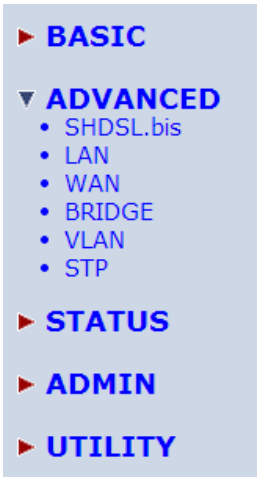


EoA (Ethernet-over-ATM) protocol is commonly used to carry data between local area networks that use the Ethernet protocol and wide-area networks that use the ATM protocol. Many telecommunications industry networks use the ATM protocol. ISPs who provide DSL services often use the EoA protocol for data transfer with their customers' DSL modems.

EoA can be implemented to provide a bridged connection between a DSL modem and the ISP. In a bridged connection, data is shared between the ISP's network and their customer's as if the networks were on the same physical LAN. Bridged connections do not use the IP protocol. EoA can also be configured to provide a routed connection with the ISP, which uses the IP protocol to exchange data.

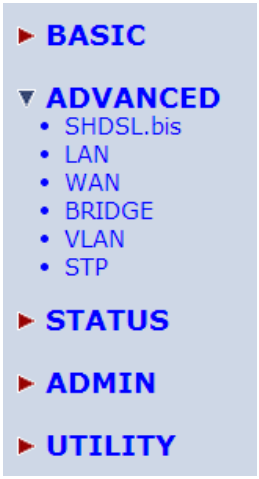
4.2 Advanced Setup

Advanced setup contains **SHDSL.bis, LAN, WAN, Bridge, VLAN and STP** parameters.

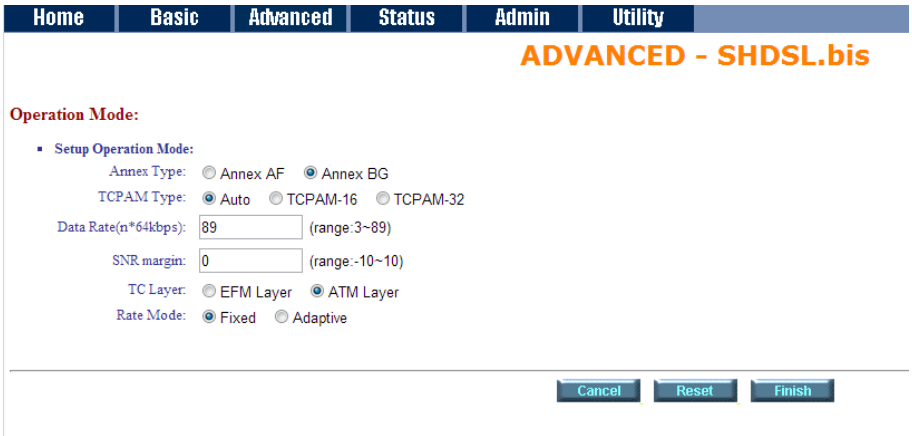


4.2.1 SHDSL.bis

You can setup the Annex type, data rate and SNR margin for SHDSL.bis parameters in SHDSL.bis.
Click SHDSL.bis



Enter Parameters in SHDSL.bis



4.2.1.1 Annex Type

There are two Annex types: **Annex AF**, **Annex BG** . If the modem must connect to your ISP, please check them about it. If your modem configed to point to point application, you must choose one of the two types according to which line rate you need.

*4.2.1.2 Data Rate (N*64kbps)*

You can setup the SHDSL.bis data rate in the multiple of 64kbps. The data rate repesent by N vaule.
N can use 3 to 36, such that 192kbps to 2304bps. The default data rate is 2304Kbps (n=36).

It can set SHDSL.bis as adaptive mode when you set Data Rate is 0. The modem will adapt the data rate according to the line status.

4.2.1.3 SNR Margin

This is an index of line connection quality. You can see the actual SNR margin in STATUS SHDSL.bis. The larger is SNR margin, the better is line connection quality.
The range of SNR Margin is -10 to 10.

If you set SNR margin in the field as 3, the SHDSL.bis connection will drop and reconnect when the SNR margin is lower than 3. On the other hand, the device will reduce the line rate and reconnect for better line connection quality.

The screen will prompt the parameters that will be written in NVRAM. Check the parameters before writing in NVRAM.
Press Restart to restart the modem working with new parameters or press continue to setup another parameter.

4.2.1.4 TC Layer

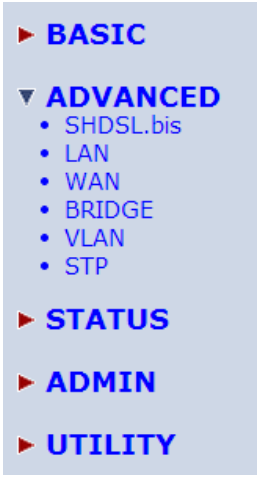
There are two TC layer setting on this modem: EFM layer and ATM layer. It is based on the networks connected: ATM-based Access Network or Ethernet-based Access Network.

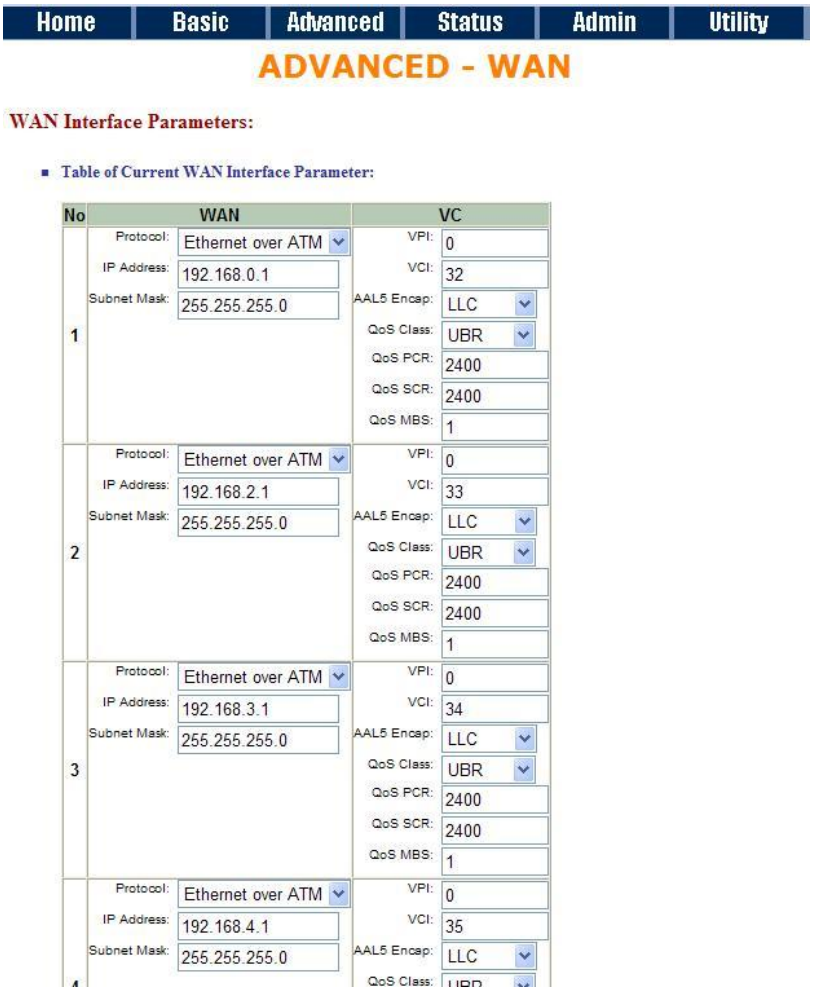
4.2.1.5 Rate Mode

For adaptive mode, you have to configure in Rate Mode. It will adapt the optimal data rate according to the line status.

4.2.2 WAN

The modem can support up to 8 PVCs. WAN 1 was configured via **BASIC** menu except QoS. If you want to setup another PVCs such as WAN 2 to 8, those parameters are setup on the pages of WAN under ADVANCED. On the other hand, you don't need to setup WAN except you apply two or more Internet Services with ISPs.





Enter the parameters:

4.2.2.1 Protocol, IP address and subnet

Protocol: You can disable or enable this WAN ports. When enable, there have only one protocol

can use: Ethernet over ATM. For Ethernet over ATM , IP adrress , subnet mask and ATM parameter must be set up.

4.2.2.2 VPI

VPI: (Virtual Path Identifier) is for set up ATM Permanent Virtual Channels(PVC).The valid range for VPI is 0 to 255.

4.2.2.3 VCI

VCI: (Virtual Channel Identifier is for set up ATM Permanent Virtual Channels(PVC). The valid range for VCI is 32 to 65535 (0 to 31 is reserved for local management of ATM traffic.)

4.2.2.4 AAL5 Encap

VC-mux (VC-based Multiplexing): Each protocol is assigned to a specific virtual circuit. VC-based multiplexing may be dominant in environments where dynamic creation of large numbers of ATM VCs is fast and economical.

LLC (LLC-based Multiplexing): One VC carries multiptle protocols with protocol identifying information being contained in each packet header. Deapite the extra bandwidth and processing overhead, this method may be advantagrous if it is not practical to have a sepatate VC for each carried protocol.

4.2.2.5 QoS class

QoS (Quality of Service) **class** : The Traffic Management Specification V4.0 defines ATM service cataloges that describe both the traffic transmitted by users onto a network as well as the Quailty of Service that the network need to provide for that traffic. There have four class four choice: UBR, CBR, rt-VBR and nrt-VBR. Select CBR to specify fixed bandwidth for voice or data traffic. Select UBR for applications that are non-time sensitive, such as e-mail. Slect VBR for bursty traffic and bandwidth sharing with other applications.

UBR (Unspecified Bit Rate) is the simplest service provided by ATM networks. There is no guarantee of anything. It is a primary service used for transferring Internet traffic over the ATM network.

CBR (Constant Bit Rate) is used by connections that requires a static amount of bandwidth that is avilable during the connection life time. This bandwidth is characterized by Peak Cell Rate (PCR). Based on the PCR of the CBR traffic, specific cell slots are assigned for the VC in the schedule table. The ATM always sends a signle cell during the CBR connection's assigned cell slot.

VBR-rt (Varible Bit Rate real-time) is intended for real-time applications, such as compressed voice over IP and video comferencing, that require tightly constrained delays and delay variation. VBR-rt is characterized by a peak cell rate (PCR), substained cell rate (SCR), and maximun burst rate (MBR).

VBR-nrt (Varible Bit Rate non-real-time) is *intended for non-real-time applications, such as FTP, e-mail and browsing.*

4.2.2.6 QoS PCR

QoS PCR (Peak Cell Rate) in kbps: The maximum rate at which you expect to transmit data, voice and video. Consider PCR and MBS as a menas of reducing lantency, not increasing bandwidth. The range of PCR is 64bps to 2400kbps.

4.2.2.7 QoS SCR

QoS SCR (Substained Cell Rate): The sustained rate at which you expect to transmit data, voice and video. Consider SCR to be the true bandwidth of a VC and not the lone-term average traffic rate. The range of SCR is 64kbps to 2400kbps.

4.2.2.8 QoS MBS

QoS MBS (Maximum Burst Size): Refers to the maximum number of cells that can be sent at the peak rate. The range of MBS is 1 cell to 255 cells.

Press Finish to finish setting.

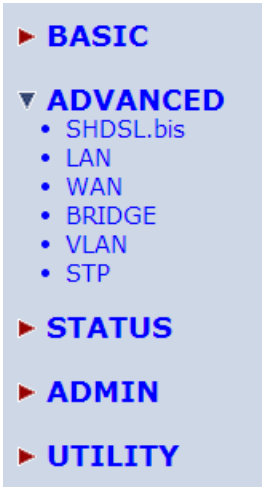
The screen will prompt the parameters that will be written in NVRAM. Check the parameters before writing in NVRAM.

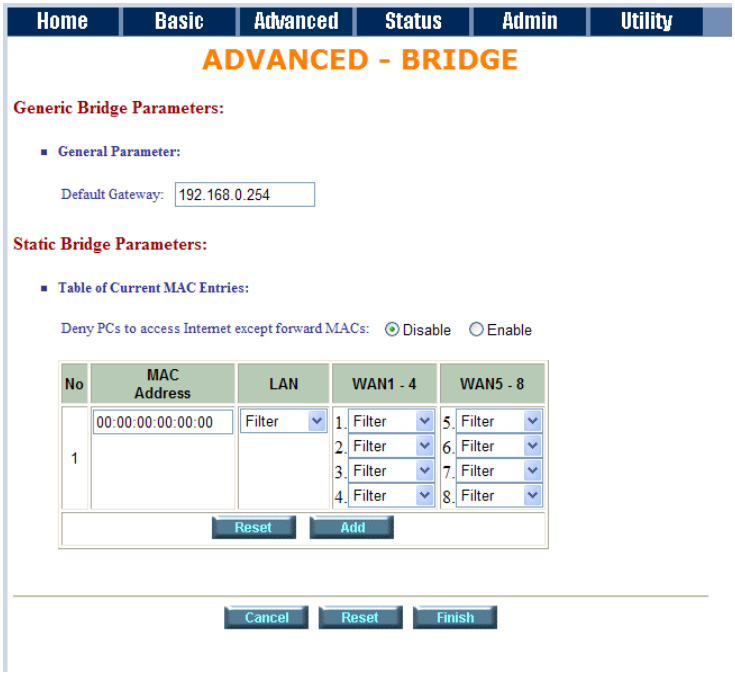
Press Restart to restart the modem working with new parameters or press continue to setup another parameter.

4.2.3 Bridge

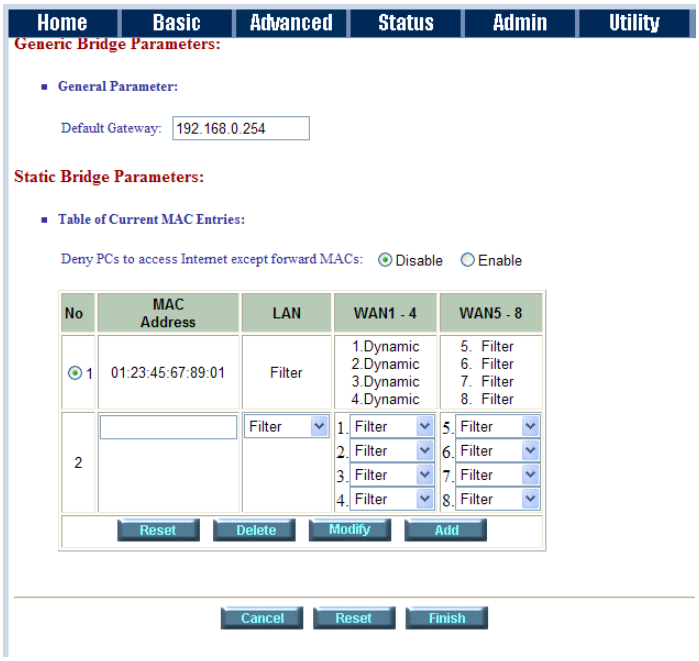
If you want to setup advanced filter function in bridge mode, you can use **BRIDGE** menu to setup the filter function, blocking function.

Click Bridge to setup.





Press Add in the bottom of web page to add the static bridge information.

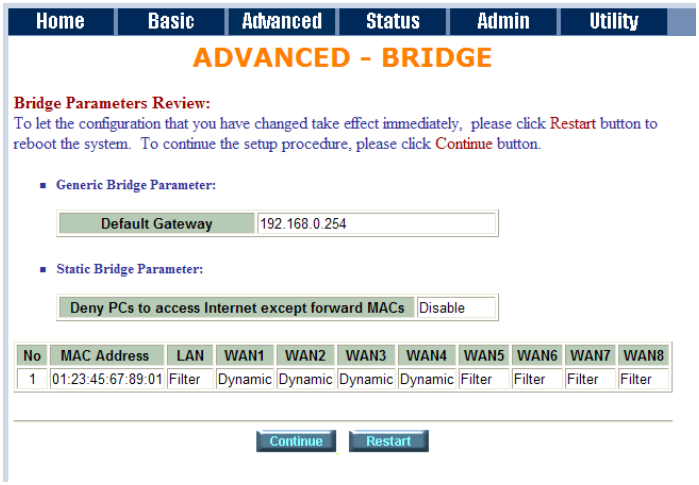


If you want to filter the designated MAC address of LAN PC to access Internet, press Add to establish the filtering table. Put the MAC address in **MAC Address** field and select Filter in **LAN** field.

If you want to filter the designated MAC address of WAN PC to access LAN, press Add to establish the filtering table. Key the MAC address in **MAC Address** field and select Filter in **WANs** field.

For example: if your VC is setup at WAN 1, select WAN 1 Filter.

Press Finish in the bottom of web page to review the bridge parameters.



The screen will prompt the parameters that will be written in NVRAM. Check the parameters before writing in NVRAM.

Press Restart to restart the modem working with new parameters or press Continue to setup another parameter.

4.2.4 VLAN

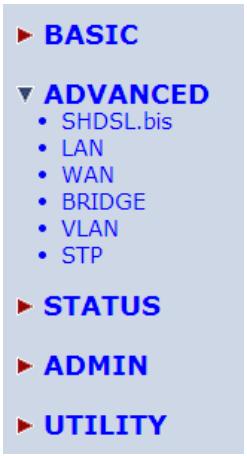
VLAN (Virtual Local Area Network) allows a physical network to be partitioned into multiple logical networks. Devices on a logical network belong to one group. A device can belong to more than one group. With VLAN, a device cannot directly talk to or hear from devices that are not in the same group.

With MTU (Multi-Tenant Unit) applications, VLAN is vital in providing isolation and security among the subscribers. When properly configured, VLAN prevents one subscriber from accessing the network resources of another on the same LAN.

VLAN also increases network performance by limiting broadcasts to a smaller and more manageable logical broadcast domain. In traditional switched environments, all broadcast packets go to each and every individual port. With VLAN, all broadcasts are confined to a specific broadcast domain.

The IEEE 802.1Q defines the operation of VLAN bridges that permit the definition, operation, and administration of VLAN topologies within a bridged LAN infrastructure.

Click VLAN to configure VLAN.

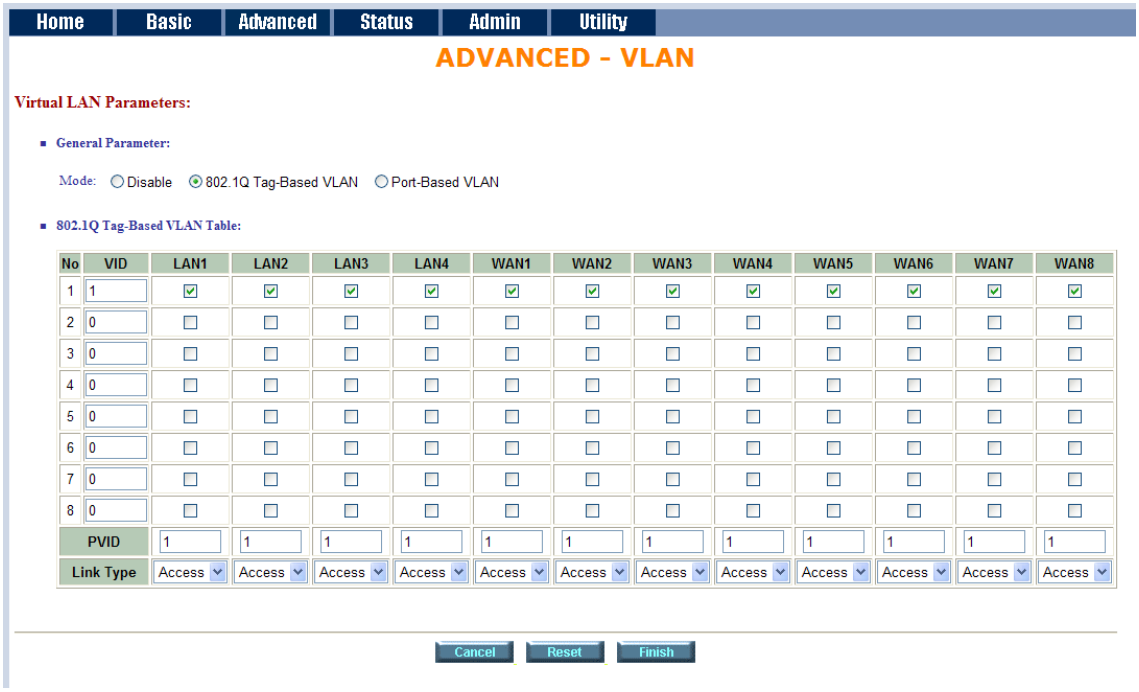


The modem supports two types of VLAN: **802.1Q Tag-Based VLAN** and **Port-Based VLAN**. User can configure one of them to the modem.

.

4.2.4.1 802.1Q Tag-Based VLAN

For setting 802.1Q VLAN click the 802.1Q Tagt-Based VLAN. The screem will prompt as the following.



VID: (Virtual LAN ID) It is a definite number of ID range from 1 to 4094.
PVID: (Port VID) It is an untagged member from 1 to 4094 of default VLAN.
Link Type: Access means the port can receive or send untagged packets.
Trunk means that the prot can receive or send tagged packets.

By default, the initially configures one VLAN, VID=1.
A port such as LAN1 to LAN4 and WAN1 to WAN8 can have only one PVID, but can have as many VIDs as the modem can store in the VLAN table.

Ports in the same VLAN group share the same frame broadcast domin thus increase network performance through reduced boardcast traffic. VLAN groups can be modified at any time by adding, moving or changing ports without any re-cabling.

4.2.4.2 Port-Based VLAN

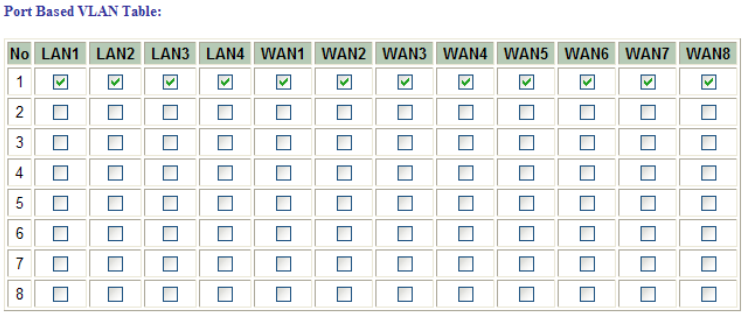
Port-Based VLANs are VLANs where the packet forwarding decision is based on the destination MAC address and its associated port.

For setting Port-Based VLAN, Click Port-Based VLAN, The screem will prompt as follows:

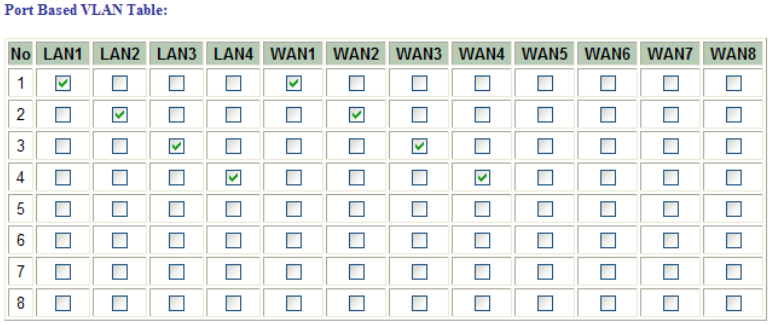
Port-Based VLANs are VLANs where the packet forwarding decision is based on the destination MAC address and its associated port.

When using the port-based VLAN, the port is assigned to a specific VLAN independent of the user or system attached to the port. This means all users attached to the port should be members in the same VLAN. The network administrator typically performs the VLAN assignment. The port configuration is static and cannot be automatically changed to another VLAN without manual reconfiguration.

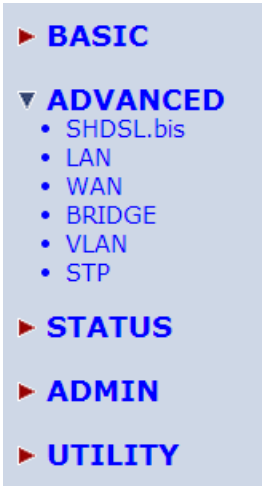
As with other VLAN approaches, the packets forwarded using this method do not leak into other VLAN domains on the network. After a port has been assigned to a VLAN, the port cannot send to or receive from devices in another VLAN.



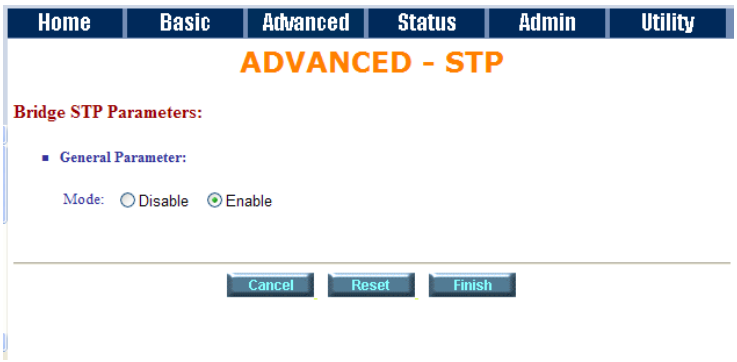
The default setting is all ports (LAN1 to LAN4 and WAN1 to WAN8) connected together which means all ports can communicate with each other. That is, there are no virtual LANs. The option is the most flexible but the least secure.



4.2.5 STP

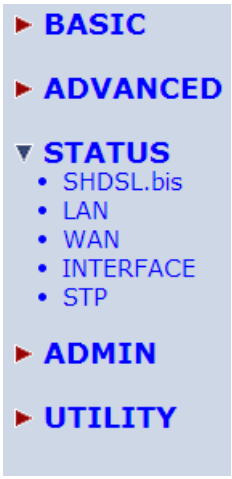


Click STP can disable or enable the bridge STP mode.



The default is disable.

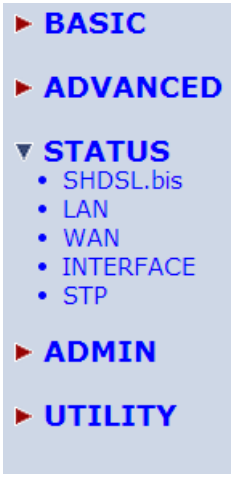
4.3 Status

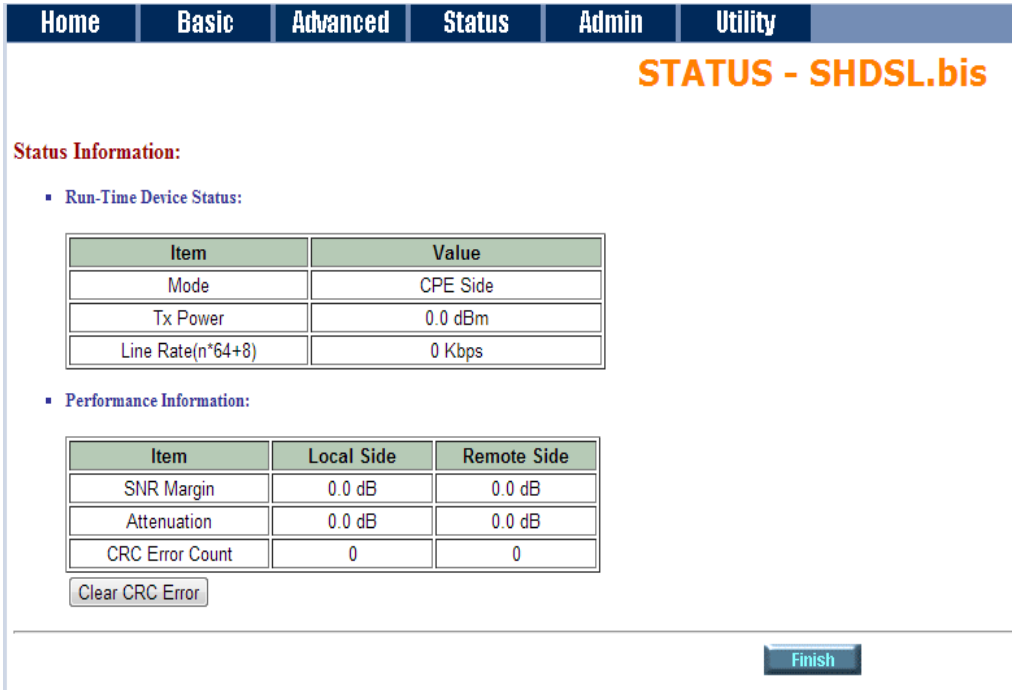


On STATUS item, you can monitor the following:

SHDSL.bis	Mode, Line rate and Performance information including SNR margin, atteunation and CRC error count.
LAN	IP type, MAC address, IP address and Subnet mask.
WAN	WAN interface information. 8 WAN interface including IP address, Subnet Mask, VPI/VCI, Encapsulation, Protocol and Flag.
INTERFACE	LAN and WAN statistics information.
STP	STP information include Bridge parameter and Ports Parameter

4.3.1 SHDSL.bis

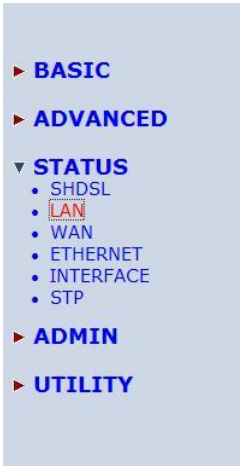


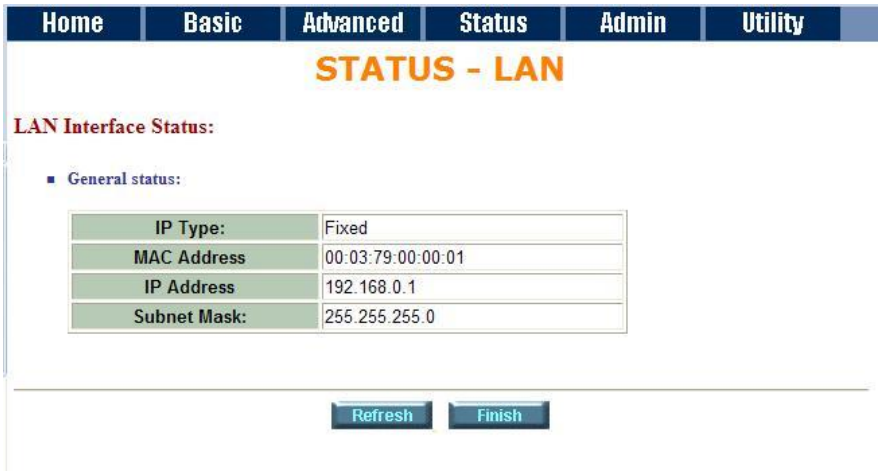


The status information shows the SHDSL.bis status and performance information. If the modem have connected to remote side, it can also show the performance information of remote side.

Click Clear CRC Error can clear the CRC error count.

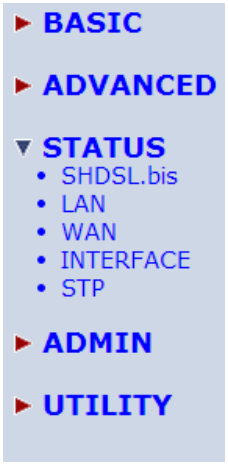
4.3.2 LAN

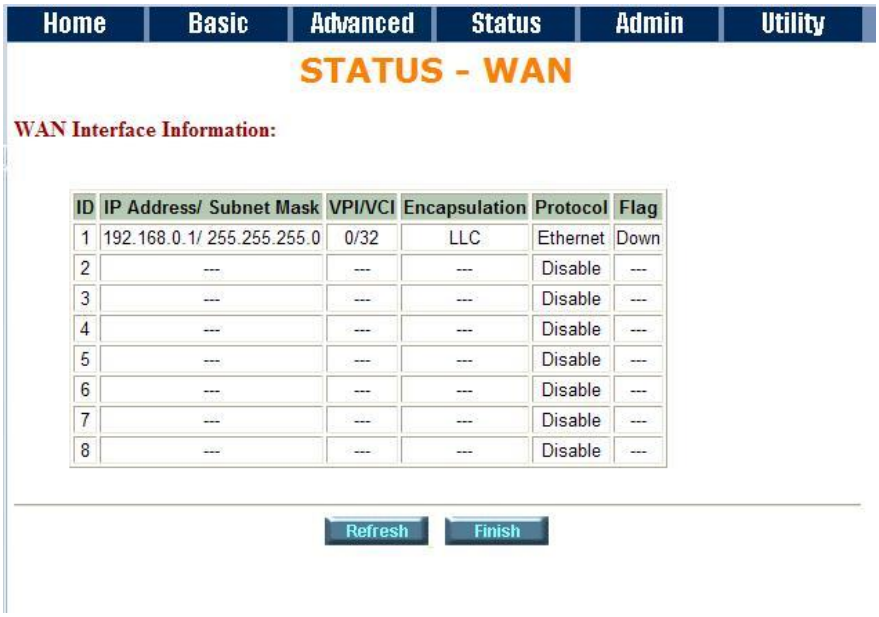




This information shows the LAN interface status.

4.3.3 WAN

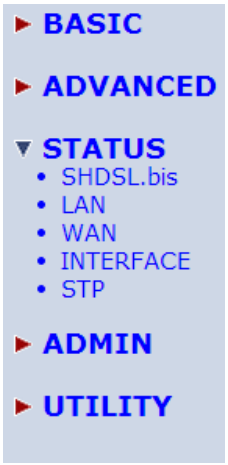


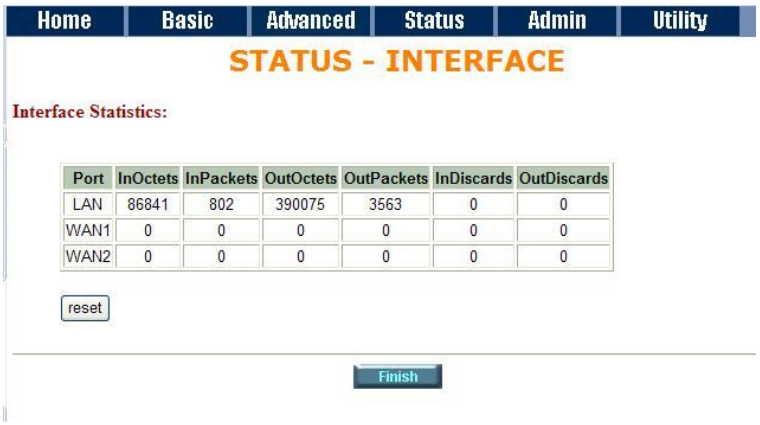


ID	IP Address/ Subnet Mask	VPI/VCI	Encapsulation	Protocol	Flag
1	192.168.0.1/ 255.255.255.0	0/32	LLC	Ethernet	Down
2	---	---	---	Disable	---
3	---	---	---	Disable	---
4	---	---	---	Disable	---
5	---	---	---	Disable	---
6	---	---	---	Disable	---
7	---	---	---	Disable	---
8	---	---	---	Disable	---

This information shows all eight WAN interface.

4.3.4 INTERFACE



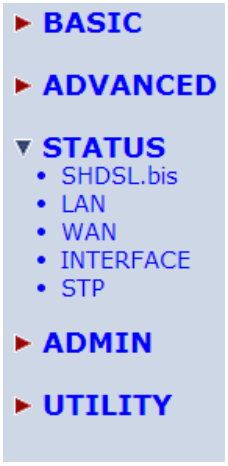


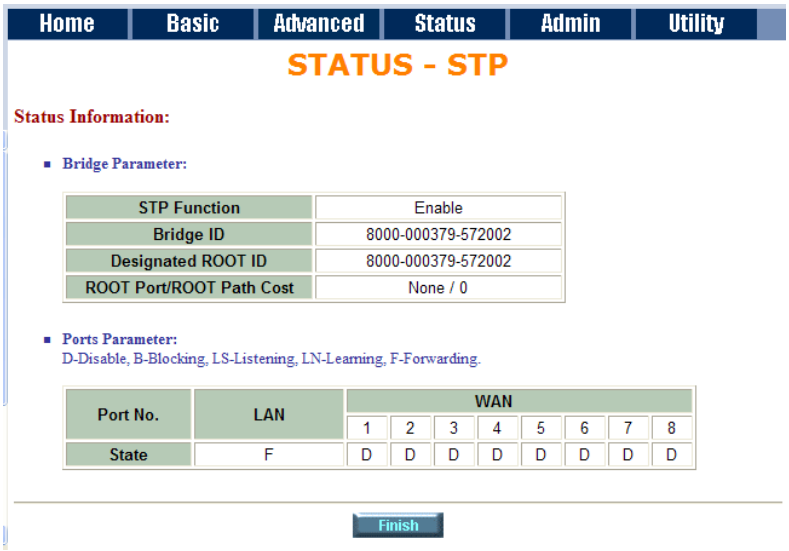
This table shows the interface statistics.

Octet is a group of 8 bits, often referred to as a byte.
Packet is a formatted block of data carried by a packet mode computer networks, often referred to the IP packet.

InOctets	The field shows the number of received bytes on this port
InPactets	The field shows the number of received packets on this port
OutOctets	The field shows the number of transmitted bytes on this port
OutPactets	The field shows the number of transmitted packets on this port
InDiscards	The field shows the discarded number of received packets on this port
OutDiscards	The field shows the discarded number of transmitted packets on this port

4.3.5 STP





This information shows the STP parameter:

The bridge parameters have:

Bridge ID: The bridge ID of a configuration message is an 8-byte field. The six low order bytes are the MAC address of the switch. The high order two-byte (unsigned 16-bit integer) field is the bridge priority number.

Designated Root ID: The unique Bridge Identifier of the Bridge assumed to be the Root, this parameter is used as the value of the Root Identifier parameter in all CBPDUs transmitted by the Bridge.

Root Port: Identifies the Port through which the path to the Root is established, and is not significant when the Bridge is the Root and is set to zero. It is the Port Identifier of the Port that offers the lowest Cost Path to the Root

Root Path Cost: The Cost of the Path to the Root from this Bridge, this is equal to the sum of the values of the Designated Cost and Path Cost parameters held for the Root Port. When the Bridge is the Root, this parameter is zero.

The ports parameters have:

Learning: This is when the modem creates a switching table that will map MAC addresses to port number.

Listening: This is when the modem processes BPDU's that allow it to determine the network topology.

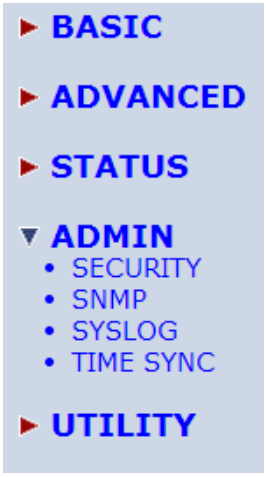
Forwarding: When a port receives or sends data. In other words, this is operating normally.

Disabled: This is when the network administrator has disabled the port.

Blocking: this means the port was blocked to stop a looping condition.

4.4 Administration

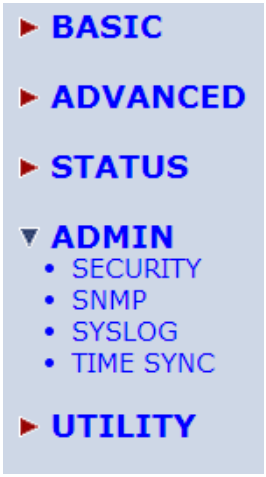
This session introduces security and simple network management protocol (SNMP) and time synchronous.



4.4.1 Security

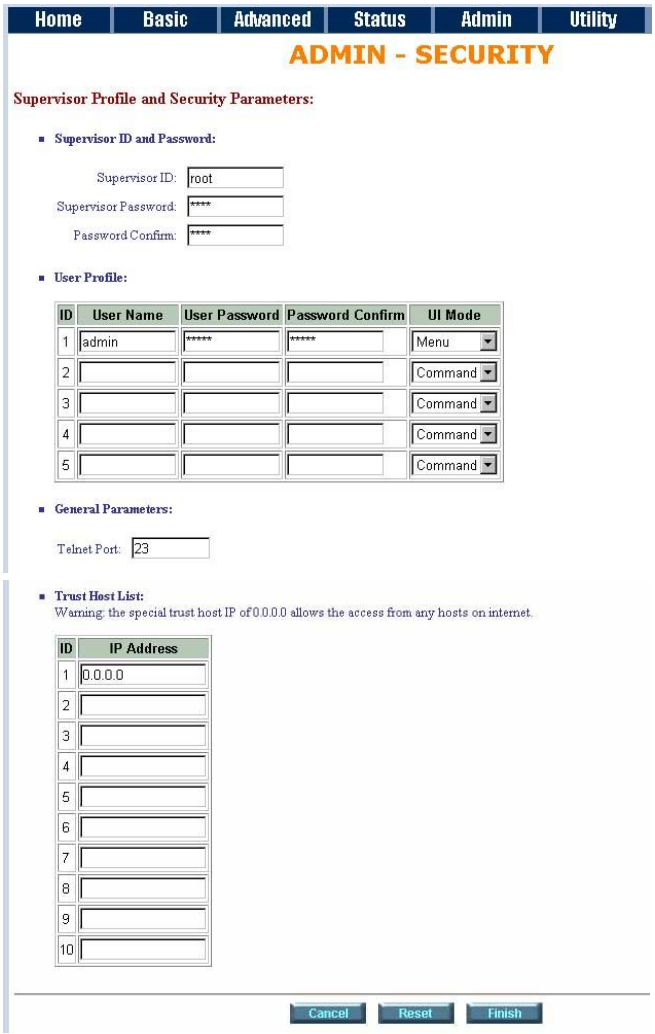
For system secutiry, suggest to change the default user name and password in the first setup otherwise unauthorized persons can access the modem and change the parameters.
There are three ways to configure the modem: Web browser, telnet and serial console.

Press **Security** to setup the parameters.



For greater security, change the Supervisor ID and password for the modem. If you don’t set them, all users on your network can be able to access the gateway using the default IP and Password.

You can authorize five legal users to access the modem via telnet or console. There are two UI modes: **menu driven mode** and **line command mode** to configure the modem.
Legal address pool will setup the legal IP addresses from which authorized person can configure the modem. This is the more secure function for network administrator to setup the legal address of configuration.



This is the default supervisor ID and password is "**root**". It is highly recommended that you change these for security purpose.

Supervisor ID: Type the new ID

Supervisor Password: Type the existing password ("root" is the default password when shipped)

Password Confirm: Retype your new password for confirmation.

Telnet Port: For using Telnet, you may change the default service port by typing the new port number. If you change the default port number then you will have to let user who wish to use the service know the new port number.

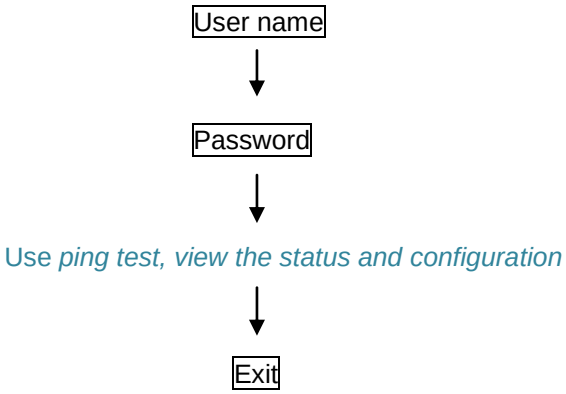
On trust host list, configured 0.0.0.0 will allow all hosts on Internet or LAN to access the modem.

Leaving blank of trust host list will cause blocking all PC from WAN to access the modem. On the other hand, only PC in LAN can access the modem.

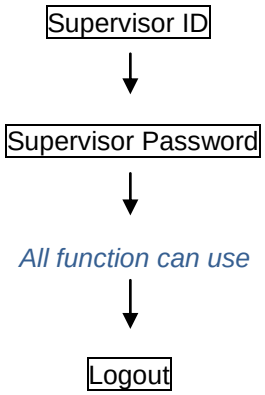
If you type the excact IP address in the filed, only the host on this listing can access to the modem. Click Finish to finish the setting.

The browser will prompt the all configured parameters and check it before writing into NVRAM. Press Restart to restart the gateway working with the new parameters and press Continue to setup other parameters.

Telnet or Console mode:



Web Brower mode:



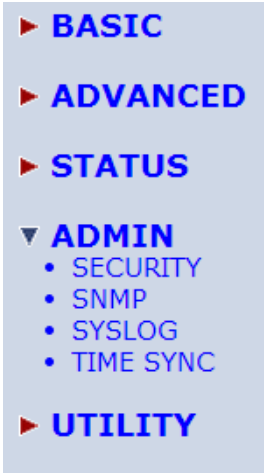
	Factory default
User name	admin
Password	admin
Supervisor ID	root
Supervisor Password	root

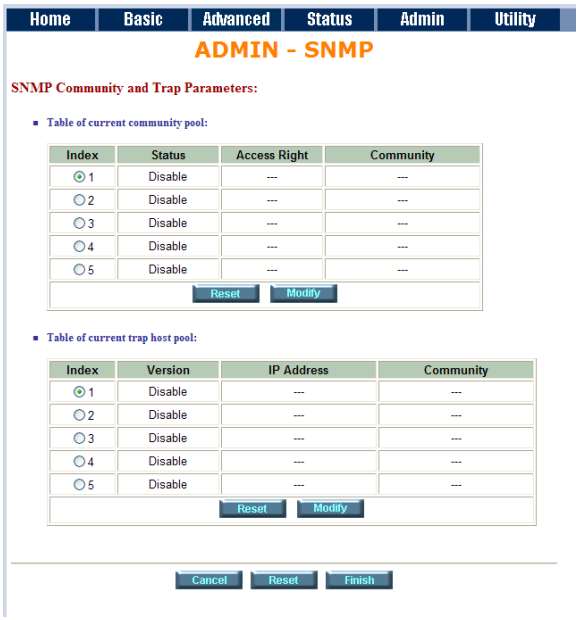
4.4.2 SNMP

Simple Network Management Protocol (SNMP) provides for the exchange of messages between a network management client and a network management agent for remote management of network nodes. These messages contain requests to get and set variables that exist in network nodes in order to obtain statistics, set configuration parameters, and monitor network events. SNMP communications can occur over the LAN or WAN connection.

The modem can generate SNMP traps to indicate alarm conditions, and it relies on SNMP community strings to implement SNMP security.
This modem support both MIB I and MIB II.

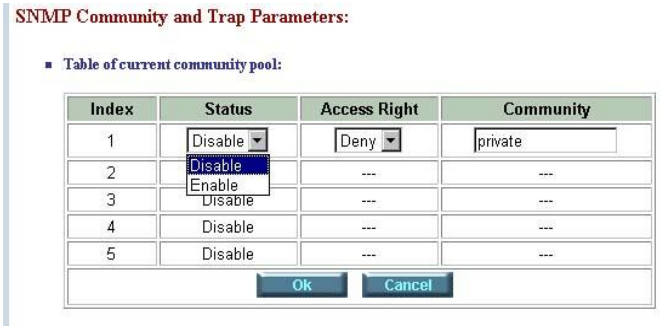
Click SNMP to configure the parameters.





4.4.2.1 Community pool

Press Modify to modify the community pool. You can setup the access authority.



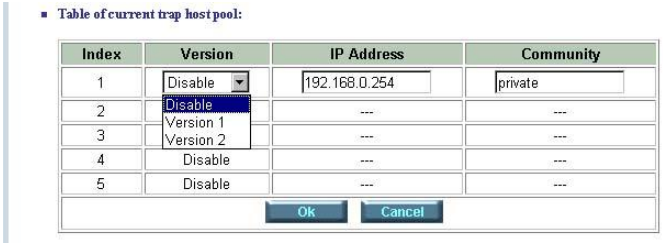
SNMP **Status**: Enable

Access Right: Deny for deny all access
Read for access read only
Write for access read and write.

Community: it serves as password for access right.
After configuring the community pool, press OK.

4.4.2.2 Trap host pool

SNMP trap is an informational message sent from an SNMP agent to a manager. Click Modify to modify the trap host pool.



Version: select version for trap host. (Version 1 is for SNMPv1; Version 2 for SNMPv2).
IP Address: type the trap host IP address
Community: type the community password. The community is setup in community pool.

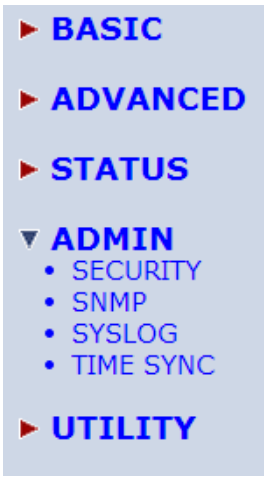
Press OK to finish the setup.

The browser will prompt the configured parameters and check it before writing into NVRAM.

Press Restart to restart the gateway working with the new parameters and press Continue to setup other parameters.

4.4.3 SYSLOG

Syslog is a standard method of centralizing various logs. You can use a syslog server to store your servers logs in a remote location for later perusal or long-term storage.



Click SYSLOG to configure

To send logs to the LOG server, you must configure the other servers from your network to send logs to that server.

Syslog Service setup

1. Click the enable item of **Syslog Server Service** to turn on syslog service.
2. Select the syslog server facility. The log facility allows you to send logs to different files in the syslog server.

Syslog Server Setup

3. Specify a server name to which all syslog messages will be sent.
4. Specify a UDP port number to which the syslog server is listening. The default value is 514. Make sure this is not blocked from your firewall.

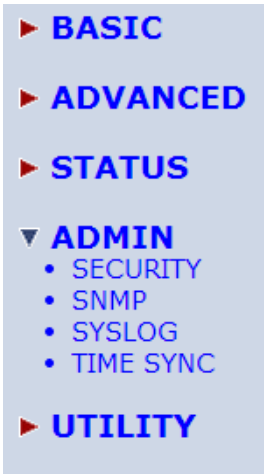
Press Finish to finish the setup. The browser will prompt the configured parameters and check it

before writing into NVRAM.

4.4.4 Time Sync

Time synchronization is an essential element for any business, which relies on the IT system. The reason for this is that these systems all have clock that is the source of timer for their filing or operations.

Click TIME SYNC.



Time synchronization has two methods:

Sync with PC	Synchronization with PC
SNTP v4.0.	Simple Network Time Protocol with Version 4

4.4.4.1 Synchronization with PC

For synchronization with PC, select Sync with PC. The modem will synchronize the time with the connecting PC.

4.4.4.2 SNTP v4.0

For using the SNTP, select SNTP v4.0.

SNTP is the acronym for Simple Network Time Protocol, which is an adaptation of the Network Time Protocol (NTP) used to synchronize computer clocks in the Internet. SNTP can be used when the ultimate performance of the full NTP implementation.

Service: Enable

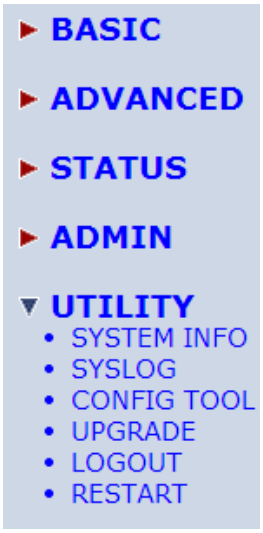
Time Server 1, Time Server 2 and Time Server 3: All of the time server around the world can be used but suggest using the time server nearby to your country. You can set up maximum three time server on here.

Time Zone: Select the time difference between UTC(Universal Time Coordinated, formerly known as GMT, Greenwich Mean Time) and your time zone from the drop-down list box.

Update Period: How many times the modem can resynchronize to time server. The unit is second.

Press Finish to finish the setup. The browser will prompt the configured parameters and check it before writing into NVRAM.

4.5 Utility

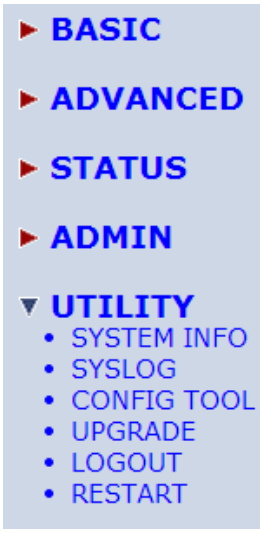


This section will describe the utility of the product including:

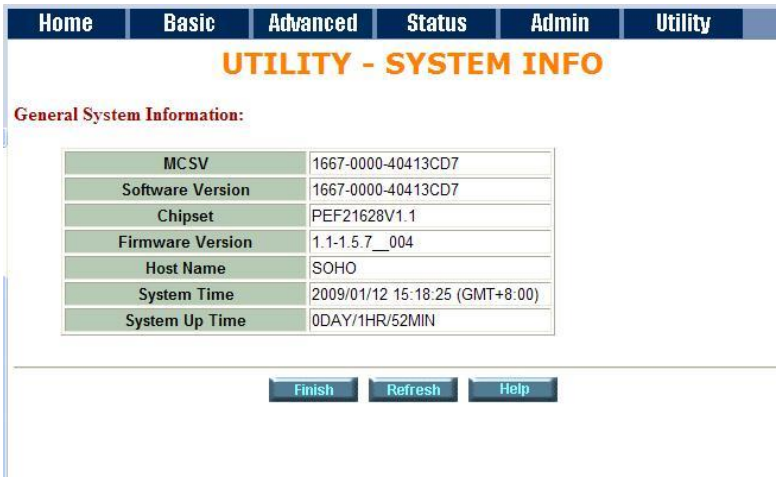
SYSTEM INFO	Show the system information
SYSLOG	Capturing log information
CONFIG TOOL	Load the factory default configuration, restore configuration and backup configuration
UPGRADE	Upgrade the firmware
LOGOUT	Logout the system
RESTART	Restart the modem

4.5.1 System Info

Click System Info for review the information.



The browser will prompt the system information.

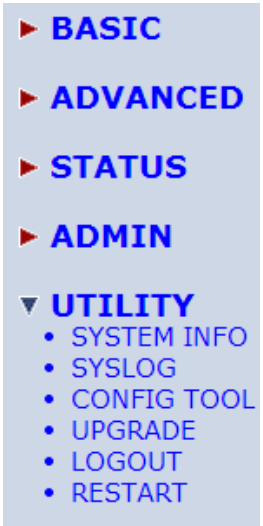


There will display general system information including: MCSV, software version, chipset, firmware version, Host Name, System Time and System Up Time.

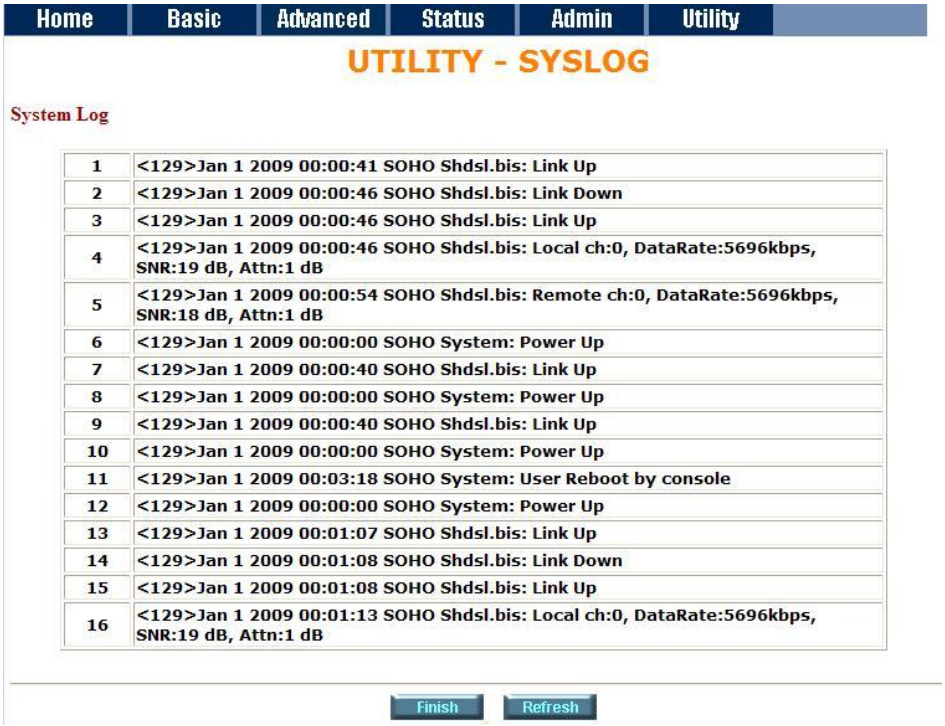
MCSV: For internal identification purposes.
Software Version: This is the modem's firmware version. This is sometimes needed by technicians to help troubleshoot problems.
Chipset: This is the SHDSL.bis chipset model name.
Firmware Version: This is the chipset's firmware version.
Host Name: This is the system name you enter in BASIC Setup. It is for identification purposes.
System Time: This field display your modem's present date and time.
System Up Time: This is the total time on the modem has been on.

4.5.2 SYSLOG

SHDSL.bis modem support detailed logging via Syslog function. The syslog protocol allows devices to send event notification messages across an IP network to syslog servers that collect the event message. The modem can generate a syslog message and send it to a syslog server.



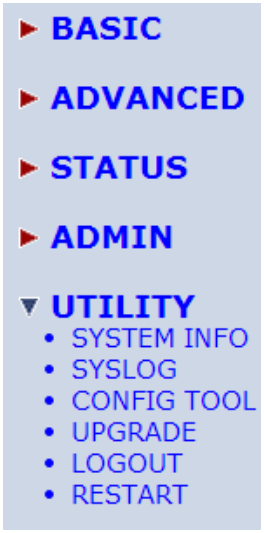
Press SYSLOG, it sends the syslog messages shown as follows:


Home
Basic
Advanced
Status
Admin
Utility
UTILITY - SYSLOG
System Log
1 <129>Jan 1 2009 00:00:41 SOHO Shdsl.bis: Link Up
2 <129>Jan 1 2009 00:00:46 SOHO Shdsl.bis: Link Down
3 <129>Jan 1 2009 00:00:46 SOHO Shdsl.bis: Link Up
4 <129>Jan 1 2009 00:00:46 SOHO Shdsl.bis: Local ch:0, DataRate:5696kbps, SNR:19 dB, Attn:1 dB
5 <129>Jan 1 2009 00:00:54 SOHO Shdsl.bis: Remote ch:0, DataRate:5696kbps, SNR:18 dB, Attn:1 dB
6 <129>Jan 1 2009 00:00:00 SOHO System: Power Up
7 <129>Jan 1 2009 00:00:40 SOHO Shdsl.bis: Link Up
8 <129>Jan 1 2009 00:00:00 SOHO System: Power Up
9 <129>Jan 1 2009 00:00:40 SOHO Shdsl.bis: Link Up
10 <129>Jan 1 2009 00:00:00 SOHO System: Power Up
11 <129>Jan 1 2009 00:03:18 SOHO System: User Reboot by console
12 <129>Jan 1 2009 00:00:00 SOHO System: Power Up
13 <129>Jan 1 2009 00:01:07 SOHO Shdsl.bis: Link Up
14 <129>Jan 1 2009 00:01:08 SOHO Shdsl.bis: Link Down
15 <129>Jan 1 2009 00:01:08 SOHO Shdsl.bis: Link Up
16 <129>Jan 1 2009 00:01:13 SOHO Shdsl.bis: Local ch:0, DataRate:5696kbps, SNR:19 dB, Attn:1 dB
Finish
Refresh

4.5.3 Config Tool

This configuration tool has three functions: load Factory Default, Restore Configuration, and Backup Configuration.

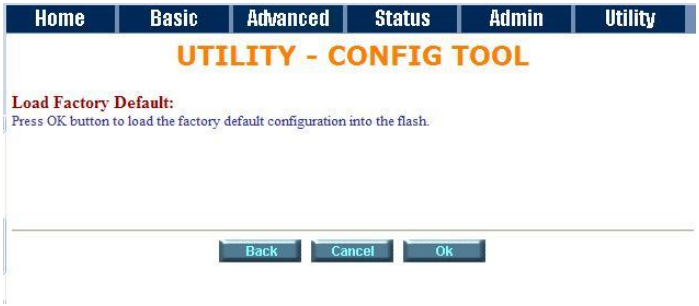
Press CONFIG TOOL.



Choose the function and then press Finish

4.5.3.1 Load Factory Default

Load Factory Default: It will load the factory default parameters to the modem.



Note: This action will change all of the settings to factory default value. On the other hand, you will lose all the existing configured parameters.

4.5.3.2 Restore Configuration

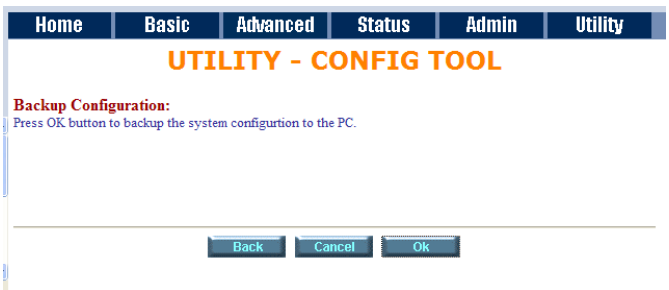
Sometime the configuration crushed occasionally. It will help you to recover the backup configuration easily.

Click Finish after selecting Restore Configuration.

Browse the route of backup file then press Finish. Brower the place of restore file name or put the name. Then press OK. The modem will automatically restore the saved configuration.

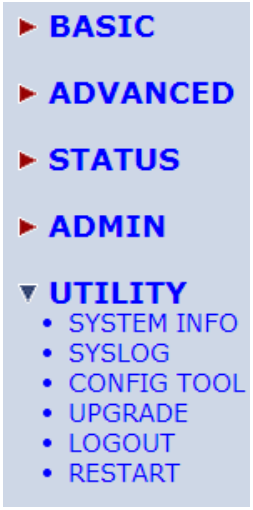
4.5.3.3 Backup Configuration

After configuration, suggest using the function to backup your modem parameters in the PC. Select the Backup Configuration and then press Finish. Browse the place of backup file name or put the name. Then press OK. The modem will automatically backup the configuration. If you don't put the file name, the system will use the default: *config1.log*



4.5.4 Upgrade

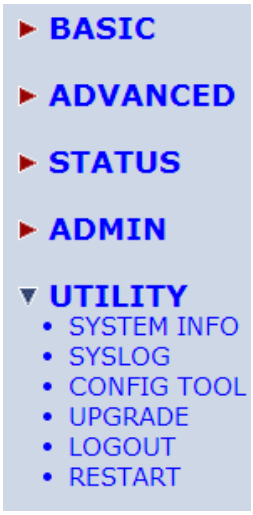
You can upgrade the gateway using the upgrade function.
Press Upgrade in UTILITY.



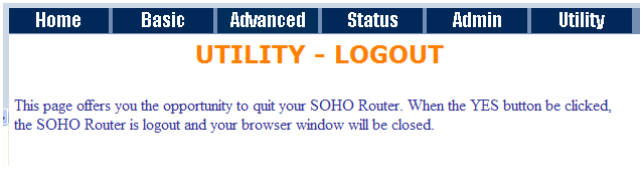
Select the firmware file name by click Browse on your PC or NB and press OK button to upgrade.
The system will reboot automatically after finish the firmware upgrade operation.

4.5.5 Logout

To logout the modem, press LOGOUT in UTILITY.



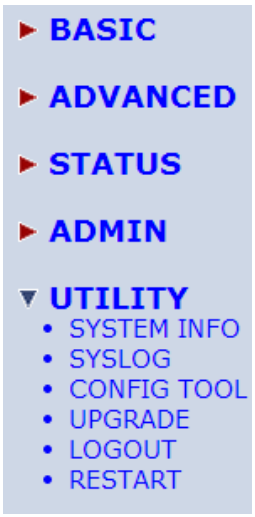
For logout system and close window, click the LOGOUT in UTILITY

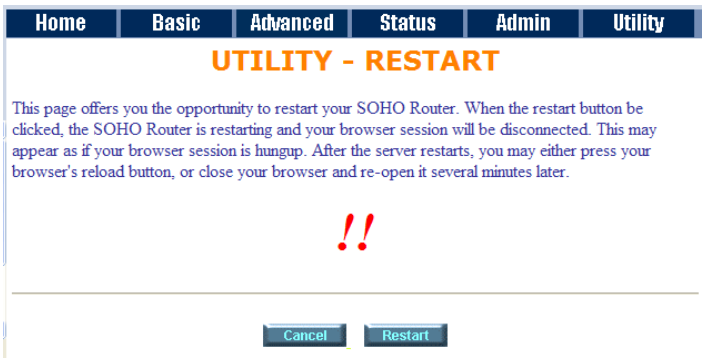

Home
Basic
Advanced
Status
Admin
Utility
UTILITY - LOGOUT
This page offers you the opportunity to quit your SOHO Router. When the YES button be clicked, the SOHO Router is logout and your browser window will be closed.

When click the Yes button, the modem will logout and browser window will be closed.

4.5.6 Restart

For restarting the modem, click the RESTART in UTILITY.



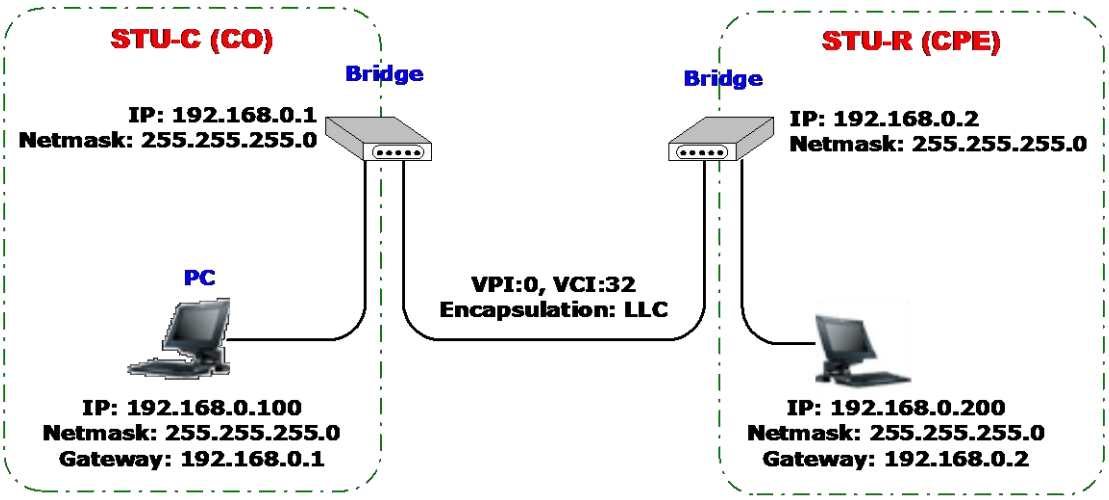

Home
Basic
Advanced
Status
Admin
Utility
UTILITY - RESTART
This page offers you the opportunity to restart your SOHO Router. When the restart button be clicked, the SOHO Router is restarting and your browser session will be disconnected. This may appear as if your browser session is hungup. After the server restarts, you may either press your browser's reload button, or close your browser and re-open it several minutes later.
!!
Cancel
Restart

Press Restart to reboot the modem.

When the restart button been clicked, the modem will restarting and the browser session will be disconnected. This may appear as if your browser session is hung up. After the modem restarts, you may either click the browser's reload button or close the browser and re-open it later.

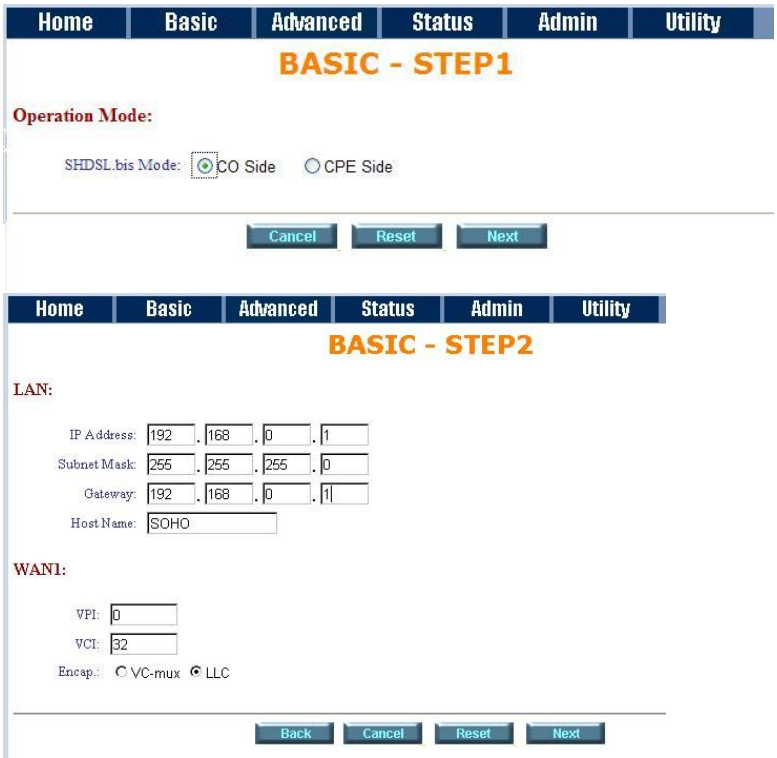
4.6 Example

4.6.1 LAN-to-LAN connection with bridge Mode



4.6.1.1 CO side

Click Bridge and CO Side to setup the modem and then click Next.



Enter **LAN** Parameters
IP: 192.168.0.1
Subnet Mask: 255.255.255.0
Gateway: 192.168.0.1
Host Name: SOHO

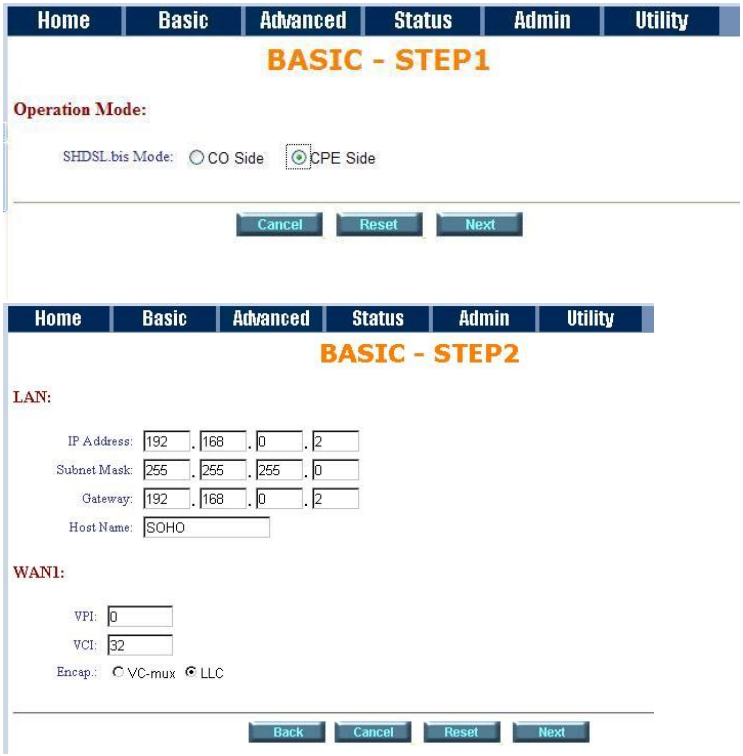
Enter **WAN1** Parameters
VPI: 0
VCI: 32

Click LLC
Click Next

The screen will prompt the new configured parameters. Check the parameters and Click Restart
The modem will reboot with the new setting.

4.6.1.2 CPE Side

Click Bridge and CPE Side to setup Bridge mode of the modem and then click Next.



Enter **LAN** Parameters
IP: 192.168.0.2
Subnet Mask: 255.255.255.0
Gateway: 192.168.0.2
Host Name: SOHO

Enter **WAN1** Parameters
VPI: 0
VCI: 32
Click LLC
Click Next

The screen will prompt the new configured parameters. Check the parameters and Click Restart
The modem will reboot with the new setting.

5 Configuration via Serial Console or Telnet with Menu Driven Interface

In this section, the detail of menu-driven user interface will be described below line by line

5.1 Introduction

5.1.1 Serial Console

Check the connectivity of the RS-232 cable. Connect the male 9-pin end of console port of the modem and connect the female end to a serial port of your computer.
Start your terminal access program by VT100 terminal emulation with the following parameters:

Parameter	Value
Baudrate	9600bps
Data Bits	8
Parity Check	No
Stop Bits	1
Flow-control	No

Press the SPACE key until the login screen appears. When you see the login screen, you can logon to modem.

Note: Only SPACE key invoke the login prompt. Pressing other keys does not work.

```
User: admin
Password: *****
```

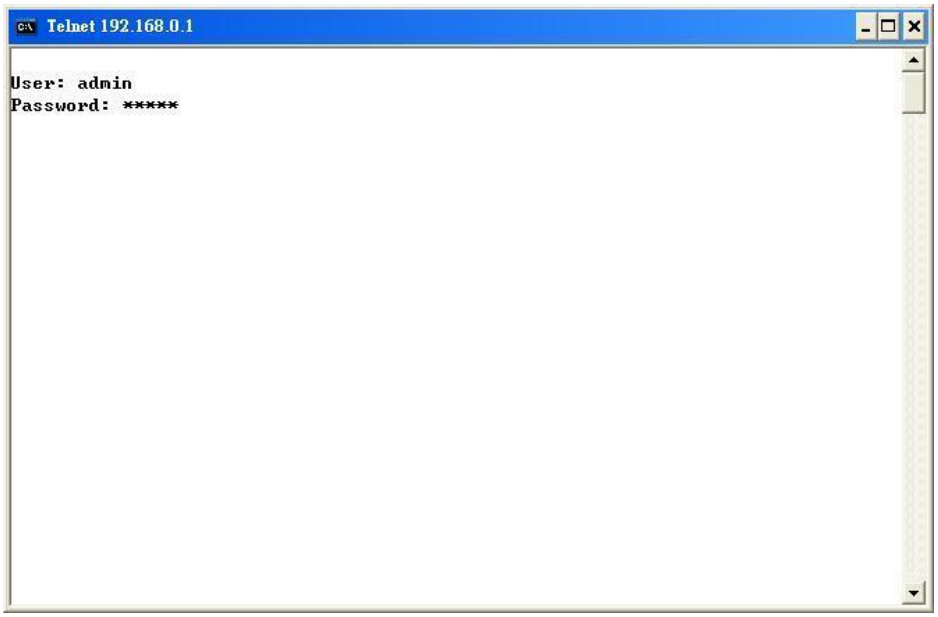
Note: The factory default **User** and **Password** are “admin” both.

5.1.2 Telnet

Make sure the correct Ethernet cable connected the LAN port of your computer to this modem. The LAN LNK LED indicator on the front panel shall light if a correct cable is used. Starting your Telnet client with VT100 terminal emulation and connecting to the management IP of modem.
Type the command line on DOS mode: telnet 192.168.0.1

Note: The default IP address is 192.168.0.1.

Wait for the login prompt appears. Input User and Password after login screen pop up:



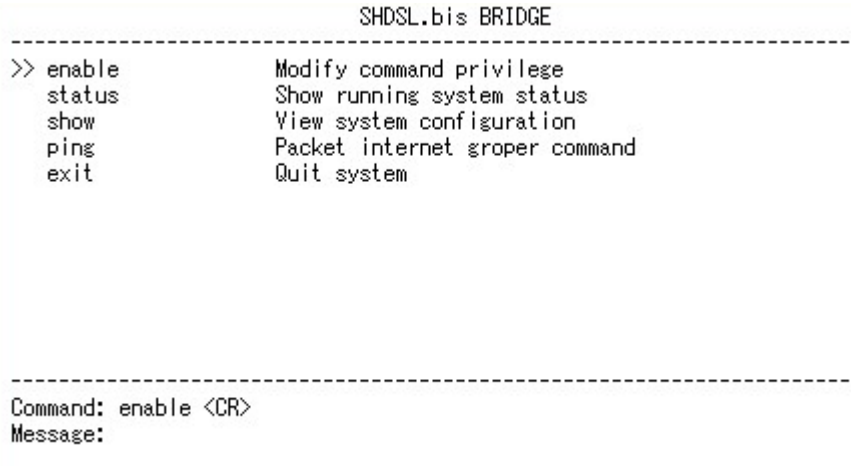
5.1.3 Operation Interface

```
                                SHDSL.bis BRIDGE
------------------------------------------------------------
Status Window...

General system information
 MCSV               :149B-0000-52420091
 Software Version   :149B-0000-52420091
 Chipset            :CX98101-11Z
 Firmware Version   :G127
 Hostname           :SOHO
 System Up Time     :0DAY/0HR/6MIN

Press 'Enter' to Return Menu Window...
```

For serial console and Telnet management, the modem implements two operational interfaces: Command Line Interface (CLI) and menu driven interface. The CLI mode provides users a simple interface, which is better for working with script file. The menu driven interface is a user-friendly interface to general operations. The command syntax for CLI is the same as that of the menu driven interface. The only difference is that the menu driven interface shows you all of available commands for you to select. You don't need to remember the command syntax and save your time on typing the whole command line.

The following figure gives you an example of the menu driven interface. In the menu, you scroll up/down by pressing key I / K, select one command by key L, and go back to a higher level of menu by key J.
For example, to show the system information, just logon to the modem, move down the cursor by pressing key K twice and select "show" command by key L, you shall see a submenu and select "system" command in this submenu, then the system will show you the general information.

5.1.4 Window structure



From top to bottom, the window is divided into four parts:

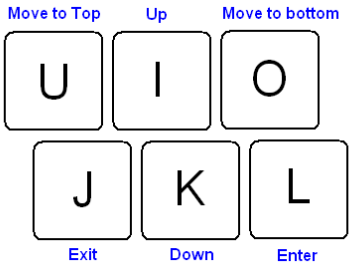
1. **Product name**: "SHDSL.bis BRIDGE"
2. **Menu field**: Menu tree prompts on this field. Symbol "**>>**" indicates the cursor place.
3. **Configuring field**: You will configure the parameters in this field. **< parameters >** indicates the parameters you can choose and **< more…>** indicates that there have submenu in the title.
4. Operation command for help

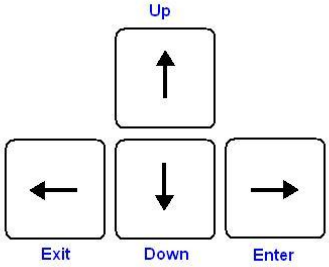
The following table shows the parameters in the brackets.

Command	Description
<ip>	An item enclosed in brackets is required. If the item is shown in lower case bold, it represents an object with special format. For example, **<ip>** may be **192.168.0.3**.
<STU-C|STU-R>	Two or more items enclosed in brackets and separated by vertical bars means that you must choose exactly one of the items. If the item is shown in lower case bold with leading capital letter, it is a command parameter. For example, shdsl.bis mode is a command parameter in <STU-C|STU-R>.
[1~1999]	An item enclosed in brackets is optional.
[1~65534|-t]	Two or more items enclosed in brackets and separated by vertical bars means that you can choose one or none of the items.

5.1.5 Menu Driven Interface Commands

Before changing the configuration, familiarize yourself with the operations list in the following table. The operation list will be shown on the bottom field of the window.





Menu Driven Interface Commands

Keystroke	Description
[UP] or I	Move to above field in the same level menu.
[DOWN] or K	Move to below field in the same level menu.
U	Move to top field in the same level menu
O	Move to bottom field in the same level menu
[LEFT] or J	Move back to previous menu
[RIGHT] or L	Move forward to submenu
[ENTER]	Move forward to submenu
[TAB]	To choose another parameters
Ctrl + C	To quit the configuring item
Ctrl + D	Disconnection
Ctrl + U	Hot-key switch to command line interface
Ctrl + Q	Display help menu

5.2 Main menu

When enter to menu, the screen will prompt as follow.

```
>> status          Show running system status
   show             View system configuration
   ping             Packet internet groper command
   exit             Quit system
```

Command Description:

Command	Description
status	View the status of modem.
show	Show the system and configuration of modem.
ping	Internet ping command.
exit	Quit system

5.3 Status

You can view running system status of shdsl.bis, wan, interface, stp and clear via **status** command.

Move cursor " **>>** " to **status** and press enter.

```
>> Shdsl.bis       Show SHDSL.bis status
   lan              Show LAN interface status
   wan              Show WAN interface status
   interface        Show interface statistics status
   stp              Show STP status
   clear            Reset statistics
```

Command	Description
Shdsl.bis	The SHDSL.bis status includes line rate, SNR margin, TX power, attenuation, and CRC error of the product, and SNR margin, attenuation and CRC error of remote side. The modem can access remote side's information via EOC (embedded operation channel).
lan	LAN status shows all their parameters including IP address ,Net mask, Mac address and protocol information
wan	WAN status shows all their parameters including IP address ,Net mask, PVC and protocol information
interface	The statistic status of WANs and LAN interface can be monitor by interface command.
stp	Show the STP status on all LANs and WANs
clear	Clear and rest all statistics data

5.3.1 Shdsl.bis

```
------------------------------------------------------------------------------
Monitoring Window...
<SHDSL.bis Status>
SHDSL.bis Mode          : CPE Side
Line Rate(n*64)     :   0kbps
Current SNR Margin  :   0dB
Attenuation         :   0dB
CRC Error Count     :   0

SHDSL.bis Remote Side Status
Current SNR Margin  :   0dB
Attenuation         :   0dB
CRC Error Count     :   0

 ------------------------------------------------------------------------------
```

Show SHDSL.bis status includes the Mode, Line Rate, Current SNR Margin, Attenuation and CRC error count on both side.
You can press “c” to clear the CRC error count. Press “Ctrl+c” to quit this screen.

5.3.2 Wan

Move cursor “ **>>** “ to **Wan** and press enter.

```
------------------------------------------------------------------------------
Monitoring Window...
 WAN    IP address   /    NetMask     VPI/ VCI  Encap  Protocol Active
----- --------------- --------------- --- ----- ------ -------- ------
WAN1  192.168.  1.  1/255.255.255.  0   0/   32  LLC   Ethernet   No
WAN2  192.168.  2.  1/255.255.255.  0   0/   34  LLC   Ethernet   No
WAN3  192.168.  3.  1/255.255.255.  0   0/   34  LLC   Ethernet   No
WAN4  192.168.  4.  1/255.255.255.  0   0/   35  LLC   Ethernet   No
WAN5  192.168.  5.  1/255.255.255.  0   0/   36  LLC   Ethernet   No
WAN6  192.168.  6.  1/255.255.255.  0   0/   37  LLC   Ethernet   No
WAN7  192.168.  7.  1/255.255.255.  0   0/   38  LLC   Ethernet   No
WAN8  192.168.  8.  1/255.255.255.  0   0/   39  LLC   Ethernet   No

------------------------------------------------------------------------------
```

Show WAN status include IP address, Net Mask, VPI/VCI, encapsulation type, protocol on each WAN ports

5.3.3 Interface

Move cursor " **>>** " to **Interface** and press enter.

```
------------------------------------------------------------------------------
Monitoring Window...
<Interface Statistics>
Port    InOctets    InPackets   OutOctets   OutPackets InDiscards OutDiscards
---- ------------ ---------- ------------ ---------- ---------- -----------
 LAN           0         0          512         8         0          0
WAN1           0         0            0         0         0          0
WAN2           0         0            0         0         0          0
WAN3           0         0            0         0         0          0
WAN4           0         0            0         0         0          0
WAN5           0         0            0         0         0          0
WAN6           0         0            0         0         0          0
WAN7           0         0            0         0         0          0
WAN8           0         0            0         0         0          0
------------------------------------------------------------------------------
```

You can view interface statistics data on one LAN port and eight WAN ports.

5.3.4 STP

Move cursor " **>>** " to STP and press enter.

```
------------------------------------------------------------------------------

<STP Status>
Bridge ID / Designated ROOT ID  : 8000-000379-000001 / 8000-000379-000001
ROOT Port / ROOT Path Cost      : None /      0
Max Age/Forward Delay/Hello Time:   20 /   15 /    2(secs)

           LAN1 LAN2 LAN3 LAN4 WAN1 WAN2 WAN3 WAN4 WAN5 WAN6 WAN7 WAN8
 ----------  ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ---- ----
     State     D   LN    D    D    D    D    D    D    D    D    D    D
  Priority   128  128  128  128  128  128  128  128  128  128  128  128
 Path Cost   100  100  100  100  500  500  500  500  500  500  500  500

<Hint> D-Disable, B-Blocking, LS-Listening, LN-Learning, F-Forwarding.
 ------------------------------------------------------------------------------
```

You can view all STP status on all LANs and WANs ports.

The STP state per LANs and WANs are as following:

Blocking - A port that would cause a switching loop, no user data is sent or received but it may go into forwarding mode if the other links in use were to fail and the spanning tree algorithm determines the port may transition to the forwarding state. BPDU data is still received in blocking state.

Listening - The switch processes BPDUs and awaits possible new information that would cause it to return to the blocking state.

Learning - While the port does not yet forward frames (packets) it does learn source addresses from frames received and adds them to the filtering database (switching database)

Forwarding - A port receiving and sending data, normal operation. STP still monitors incoming BPDUs that would indicate it should return to the blocking state to prevent a loop.

Disabled - Not strictly part of STP, a network administrator can manually disable a port

5.4 Show

You can view the system information, configuration and configuration in command script by **show** command.

Move cursor " **>>** " to **show** and press enter.

```
>> system          Show general information
   config          Show all configuration
   script          Show all configuration in command script
```

Command	Description
system	The general information of the system will show in system command.
config	Config command can display detail configuration information.
script	Configuration information will prompt in command script.

5.4.1 System information

Move cursor to " **>>** " to **system** and press enter.

```
------------------------------------------------------------------------
Status Window...
General system information
 MCSV               : 1473-0000-30316008
 Software Version   : 1473-0000-30316008
 Chipset            : G2237-108-041GT
 Firmware Version   : R3.1.1
 Hostname           :SOHO
 System Up Time     :0DAY/2HR/39MIN

------------------------------------------------------------------------
```

From this screen, you can know more about the general information of this modem.

5.4.2 Configuration information

Move cursor to " **>>** " to **config** and press enter.
You can view all setting using table format.

5.4.3 Configuration with Script format

Move cursor to " **>>** " to **script** and press enter.
You can view all setting using script format.

5.5 Ping

Ping command can use to diagnose basic network connectivity of modem. Move cursor " **>>** " to **ping** and press enter.

The ping command sends an echo request packet to an address, and then awaits a reply. The ping output can help you evaluate path-to-host reliability, delays over the path, and whether the host can be reached or is functioning.

```
------------------------------------------------------------------------
Command: ping <ip> [1~65534|-t] [1~1999]
Message: Please input the following information.

IP address <IP> : 10.0.0.1
Number of ping request packets to send (TAB select): -t
Data size [1~1999]: 32
------------------------------------------------------------------------
```

There are 3 parameters for ping command:

```
<ip> [1~65534|-t] [1~1999]
```

IP address: The IP address which you want to ping.

Number of ping request packed to send, key TAB for further selection:

- Default: It will send 4 packets only
- 1~65534: Set the number of ping request packets from 1 to 65534
- -t : It will continuous until you key Ctrl+C to stop

Data Size: From 1 to 1999

5.6 Exit

If you want to exit the system without saving, use **exit** command to quit system.

```
------------------------------------------------------------------------
 Command: exit <CR>
 Message: Please input the following information.

 Do you want to disconnect? (y/n):

------------------------------------------------------------------------
```

Press "y" to confirm the exit operation.